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I. Heathcoat's Lace Machinery.

II. Perkins's mode of Heating Buildings; Cowper's Printing Apparatus: Hale's Propelling Machinery; Drake's Tanning Apparatus; Gray's Apparatus for Sheathing Ships; and Wilson's Machine for Preparing Rice.

III. Garsed and Robinson's Heating Apparatus; Gibbs and Chaplin's Improved Carriage; Jellicorse's Spinning Machinery; and Tyzack and Company's Improved Windlass.

IV. Church's Locomotive Steam Carriage.

V. Beale's Steam Engine; Holmes's Apparatus for Heating Houses; Berry's Toggle Joint Press; and Pycroft's Stove Grate.

VI. Mosley and Bell's Pill Boxes; and Scrivenor's Railways.

VII. Burges's Sketching Apparatus; and Savoye's Improved Mills.

VIII. Macdonald's Railway.

IX. Brown's Steam Engine; Parker's Improved Pens; and Winfield's Bedsteads.

X. Roberts's Steam Engine; and Amie's Improved Pulp Strainer for making Paper.

XI. Travis's Roving Machinery; Hainsselin's Motive Power; and Kreft's Apparatus for Shaping Metal Plates.

XII. Fischer's Piano-fortes; and Joyce's Horse Collars.

XIII. Newton's Apparatus for producing Instantaneous Light.

XIV. Gibbs and Applegnth's Steam Carriage; and Walmsley's Fur Cutting Machine.

XV. and XVI. Church's Nail Making Machinery.

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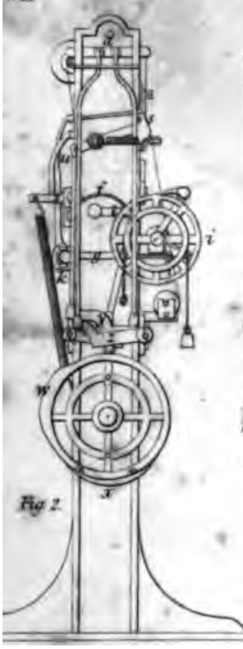

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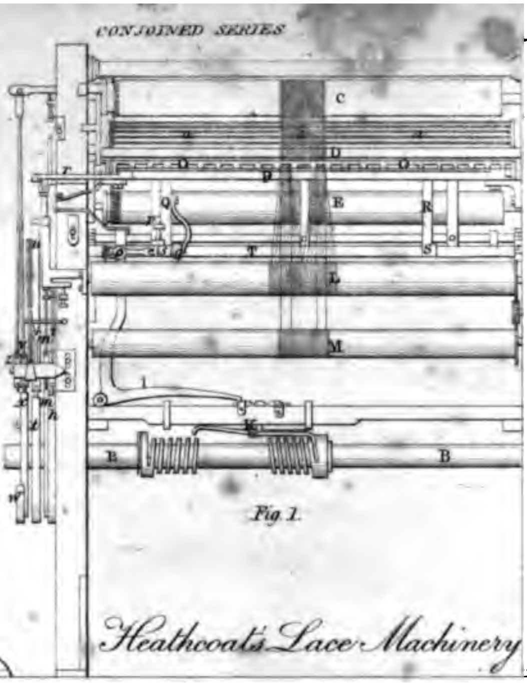
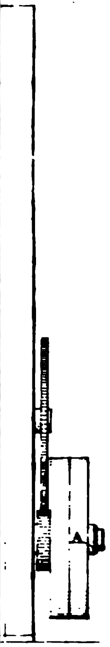
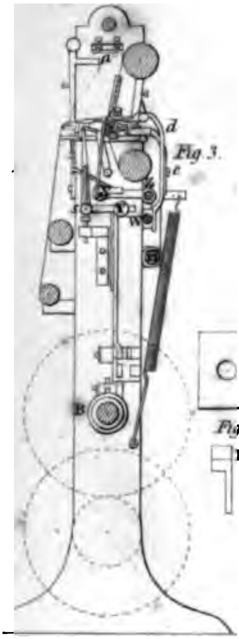


Fig. 1.

Heathcoat's Lace Machinery





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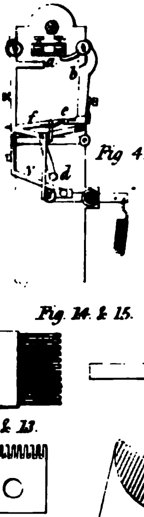

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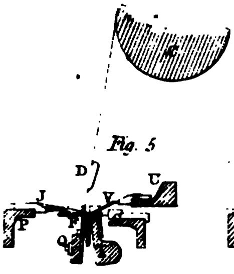

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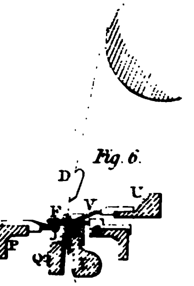

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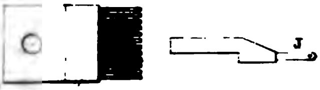

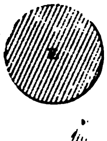

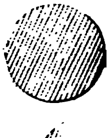

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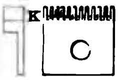

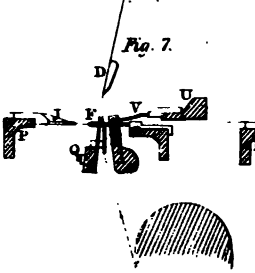

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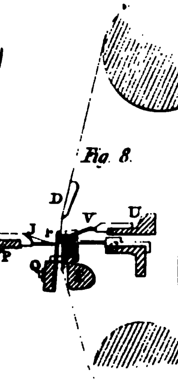

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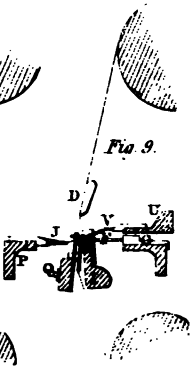
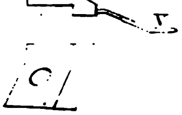


Fig. 9.

Fig. 10 & 11.



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PATENT INVENTIONS.

No. IX.

(CONJOINED SERIES.)

Recent Patents.

To JOHN HEATHCOAT, *of Tiverton, in the county of Devon, lace manufacturer, for a method or methods of ornamenting, embroidering, or working devices upon lace, net, and other fabrics.*—[Sealed 16th February, 1832.]

THIS invention of a method or methods of ornamenting, embroidering, or working devices upon lace, net, and other fabrics, consists in the employment of certain mechanism, partly resembling that of the ordinary warp lace frame, This machinery is enabled to work into the meshes, and around the threads of bobbin net lace, and through or upon the fibres composing other fabrics, stitches, or loops of silk, cotton, or other threads or yarns, for the purpose of producing upon such fabrics embroidered patterns or devices, in stripes, zig-zags, Grecian borders, scroll work, vandykes, and various other running or continuous ornamental forms.

The adaptation of mechanism employed for this purpose, is the same in principle as that described in the Specification of a Patent granted the same inventor by His present Majesty, bearing date at Westminster, the 3d day of October, 1831, for an invention of "*certain improvements in the machinery used for the making of bobbin or twist lace net, whereby net and other fabrics may be produced,*" (see the first Vol. of our conjoined Series. page 381.)

By the former invention just alluded to, the Patentee interwove with the net as the meshes were formed in the machine, stitches or loops of silk, cotton, or other threads or yarns, producing the net and its embroidered pattern simultaneously; in the present instance, however, the embroidery is worked upon lace net, or other fabric, after the fabric has been made and finished by the ordinary means, by first rolling the said fabric tightly and smoothly upon a beam, and then placing the said beam in the upper part of the present embroidering machine, and bringing down the fabric evenly at intervals, in parallel movements by a series of points or conductors, which draw the successive rows of meshes of the net or interstices of other fabric opposite to the points of the needles and guides, which enable the threads or yarn to be passed through the fabric, and to be secured by looping or stitches in the manner explained hereafter.

The machine about to be described for accomplishing this object, is peculiarly adapted for operating on bobbin or other lace net; but as the application of the same mechanism to work upon other fabrics will be sufficiently obvious, its operation upon net only is described.

In Plate I, fig. 1, represents a front elevation of the machine; fig. 2, an elevation of that end of the machine which is toward the left hand; and fig. 3, a transverse section through the middle of the machine. The same letters of reference applying to similar parts in the several figures.

Motion is communicated by means of a strap, from any first mover to the rigger A, to which is affixed a pinion taking into a toothed wheel on the horizontal shaft B, thereby causing it to revolve. On this shaft B, are fixed the different cams or tappet wheels, and other contrivances for giving suitable movements to the various parts of the machine.

The net to be wrought upon is wound on the roller C, extending along the upper part of the machine; from this roller it is carried through a series of tension rods *a, a, a,* over a bar D, called the facing bar, to another roller E, which is intended to receive the work when finished.

The silk, cotton, or other threads or yarns to be interwoven with the net for the purpose of producing the embroidering, is wound upon the rollers L, and M, from whence it is conducted through the perforated bar O, O, to the guides and needles. The interweaving or combining of these threads with the net takes place immediately below the facing bar D, the particular method of effecting which will be best understood by reference to the enlarged figs. 5, 6, 7, 8, and 9. The needles used for this purpose, shown at F, F, are furnished with beards or spring hooks, similar to those used in warp frames, and are mounted in leads. These leads of needles are screwed upon a bar G, called the needle bar, extending along the back of the machine. The bar G, is supported by links *c*, upon the horizontal shaft H, which turns upon bearings, and is intended to communicate a vibrating movement to the needle bar. Between the needle bar and the net is fixed another bar I, extending also along the machine at the back, (see fig. 3.) On this bar there are screwed a series of combs K, K, which consist of pieces of brass, with slits or grooves cut across them at regular distances, seen detached in two positions in figs. 12 and 13, on a larger scale.

These combs K, K, are intended to act as supports and guides to the needles F, F, which slide when at work within the grooves of the combs; and as the grooves of the combs are to guide the needles through the meshes of the net, it is obvious that the distance between them must correspond with the lateral distance of the meshes of the net to be acted upon. Immediately above the needle bar G, is situate a bar U, supported by means of links *d*, from the shaft W, which shaft is capable of turning upon its bearings, fixed to the back of the standards, and of imparting a vibrating movement to the bar U. On this bar U, are screwed leads containing a series of points V, V. One of these leads, is shown detached in two positions, on an enlarged scale in figs. 10 and 11. The use of these points is to bring down the net, and also to conduct the needles with regularity and exactness through the line of meshes of the net, as they come opposite to the ends of the needles. In order to effect this with precision, the under sides of the said points, at those parts next the needles, have grooves or hollow channels in them, as seen at fig. 11, so that when they occupy a row of meshes in the net, the needles may be advanced, and by sliding along their grooves or channels, may respectively enter the same mesh of net that is occupied by the point under which it acts.

When the needles have thus entered the meshes, the points are drawn back out of them, and the bar U, being raised, the points are protruded through the row of meshes next above those last occupied; a slight downward motion is then communicated to the point bar U, which causes the point v, to force down the work or net which has been embroidered towards the work roller E, and also to bring down a fresh row of meshes to be entered by the needles.

The rollers L, M, are furnished with the yarns intended to to supply the needles, and which is to be worked upon the net. These yarns pass up through the apertures in the perforated bar O, O, to the guides and needles. Figs. 14 and 15, represent one of the guides detached in two positions. The guides are mounted in leads, and these leads are screwed upon a bar P, called the guide bar, which extends along the front of the machine nearly opposite to the needle bar. From the under side of the guide bar P, two arms Q, R, descend, which are perforated at their lower ends, and turn upon studs S, S; these are fixed in arms extending from the horizontal shaft T. This shaft is mounted upon bearings attached to the side frames, and is intended to communicate a vibratory movement to the guide bar P.

Between the guides and the needles, extending along the middle of the machine, is the bar O, called the presser bar, formed by one long brass bar, or a connected series of plates of brass. Apertures are made in this brass plate or bar O, along its entire length, as seen in fig. 1, leaving a complete straight edge at the top of it, about the eighth of an inch deep, of which the use will be shortly explained. The bar X, is by its links *e, e*, supported upon another bar Y, which turns upon pivots in arms *f, f*, extending from the shaft Z, mounted in suitable bearings at the back of the machine.

Having given the general features of the machine; the Specification proceeds to describe the manner in which the needles F, points V, guides J, combs K, and presser bar O, perform so as to produce and secure the stitches or loops upon the fabric in the act of embroidering; reserving the description of the manner of moving the parts collectively, until the objects of their particular moving are seen.

In order to explain the operation, the figures 5, 6, 7, 8, and 9, are drawn on a larger scale, shewing in five different positions in section, the points, needles, and guides in their relative situations, at different stages of the work. In fig. 9, it will be seen that the points V, V, stand in an advanced position through the meshes of the net, and through the apertures of the presser bar O, whilst the needles F, F, are drawn back clear of the net upon the combs K, K. The guides J, J, which conduct the threads or yarns to the needles, are at this time stationary, just below the points and needles. In commencing the operation at this stage, the needles F, F, are made to advance along the grooves or channels under the points V, V, through the meshes of the net, and through the apertures of the presser bar O, until they occupy the position shown in fig. 5. The thread guides J, J, are then elevated to the place which they are seen to occupy in the said fig. 5; and after having been made to move laterally over the beards of the needles F, F, by a side movement of the bar P, which carries them, they are again depressed to their former situation, as shown in fig. 6.

By these movements, the threads or yarns of silk, cotton, or other material, coming from the rollers L, and M, have been conducted and doubled over the needles, in order that when the needles recede, they may form those portions of the threads into loops, and draw them through the net. The thread guides J, J, are now shifted back to the place they occupy in fig. 7, for the purpose of tightening the threads, and securing them under the beards of the needles, after which the needles are made to retire. The needles in entering the meshes of the net, were passed through the apertures under the edge of the presser bar O, and now as they retire, the bar O, is depressed, which forces the beards on the upper sides of the needles down into their recesses. The needles, with their beards thus compressed, are shown at fig. 7, capable of repassing the meshes of net without catching. Previously to the descent of the presser bar o, the points v, v, are withdrawn from the meshes of the net, allowing the presser bar to come down upon the beards of the needles, the points v, are then elevated a little. This elevating of the points, is for the purpose of placing them exactly opposite to the row of meshes immediately above those which they last occupied. Before the needles are drawn quite out of the meshes of the net, and whilst they may be said to hold it in its place, the presser bar o, rises; the points v, are then protruded through the row of meshes above those occupied by the needles, as at fig. 8. The needles are now drawn entirely clear of the meshes of the net, and the presser bar o, acting upon the points v, depresses them the depth of a mesh, thereby bringing the net, that is, the row of meshes which they occupy, opposite to the heads of the needles, as shown in fig. 9. Cords and weights acting upon the respective rollers c, and E, cause them to obey the action of the points; the one to let off the net to be operated upon, and the other to take up that which is finished. Or it may be convenient to give movement to these rollers by wheel work.

Thus we have shown the operation of making a row of loops, and drawing them through the meshes of the net; and also of the manner in which a second row of meshes is brought down ready for the action of the needles.

The continued operation of the machine in forming loops or stitches, and combining them with the net, being exactly similar to that described in the Specification of the former Patent above alluded to, except the operating parts being reversed, it is therefore unnecessary to repeat it. The principle difference between the machine here described, and the subject of the previous Patent, consists in its being intended to act upon the net. Independently of, and apart from the machine by which the said net is made, and as a matter of convenience, the operative parts in the present machine are placed in inverted positions to those of the former.

We now proceed to describe the means by which movement may be communicated to the different parts of the machine, so as to make it perform the evolutions above described.

It has before been stated, that the various cams or tappet wheels for moving the different parts of the machine, are fixed upon the shaft B, to which rotatory motion is given. The horizontal shaft H, at the back of the machine, which supports the needle bar by means of links *e*, has an arm *g*, at its left end (see figs. 1 & 2), just over the cam or tappet wheel *h*, on the shaft B. A lever *i*, is connected by a link with this arm *g*, at the end of which there is a friction wheel, bearing on the periphery of the tappet wheel *h*.

This cam or tappet wheel is so shaped, that when the work is in that state where the needles are required to advance through the net, a recess or small radius in its periphery comes opposite to the friction wheel at the end of the lever, and allows it to descend, when a spring *k*, fixed to the shaft H, and pressing against the head of the machine, forces the needle bar G, forwards, and with it the needles, until they stand in the situation shown at fig. 5. In this position the needles F, remain stationary, whilst the guides J, have laid the threads upon them, as before explained, when an elevation upon the cam *h*, coming under the friction wheel of the lever *i*, lifts it upwards, and through the agency of the parts before described, draws the needles out of the net. They then remain until the smaller radius of the cam *h*, again comes under the wheel of the lever *i*, and the needles are advanced as before.

The guide bar P, has been represented as having two arms Q, R, with holes at their lower ends, which fit and vibrate upon the studs S, S, fixed in two arms proceeding from the horizontal shaft T; at the end of this shaft T, is an arm *l*, directly over the cam or tappet wheel *m*, from which cam it receives movement through the agency of a lever *n*, carrying an anti-friction wheel at its end. At that stage of the operation where the needles require supplying with loops of thread, an elevation upon the cam *m*, comes against the wheel of the lever and lifts it up, and the arm *l*, also, thereby causing the shaft T, to turn a little on its pivots In so doing it lifts the guide bar P, by means of its arms Q, and R, and thus elevates the guides above the needles, as shown in fig. 5.

The rise upon the cam *m*, then passes away, and allows the arm *l*, to be forced down again by a spring *f*, pressing upon its upper sides, whereby the guides are made to descend. Just as they begin to descend, an arm, projecting from the shaft T, depresses the short end of a lever *o*, by striking against the lower part of its fork, which thus elevates the opposite end; this fork acting upon a pin screwed into the bolt *p*, causes the bolt to slide upwards in its staples, which are attached to the arm Q, of the guide bar; and in so doing a shoulder in the side of the same bolt, presses against the end of the stud *q*, and as this stud cannot move, the bolt *p*, and the arm Q, with which it is connected, are compelled to move to the left upon the stud. Thus the guides are made to traverse over or across the needles, previous to descending, for the purpose of supplying the needles with portions of thread in doubles or loops, as above described.

Just before the guides have ceased to descend, the arm of the shaft T, acting against the upper part of the fork of the lever *o*, elevates its short end, and depresses that which acts upon the bolt *p*, and thus makes it slide back to its former situation. The hollow part in the side of the bolt is thus brought opposite the stud *q*, when a spring on the side of the arm Q, pressing against the back of that arm to which the stud *q*, is fixed, forces the arm Q, and the bolt *p*, connected with it, to slide back again upon the stud, towards the right, to the place it occupied before.

For drawing out the guides, so as to tighten the threads upon the needles as they begin to recede, the guide bar P, is furnished with a longitudinal arm *r*. The inner side of this arm is acted upon by an excentric plate screwed to a quadrant arm *s*, which quadrant arm is made to vibrate on its stud by an elevation on the cam wheel *t*, through the agency of a lever *u*, *u*, carrying an anti-friction wheel and a link. When the work is in that stage, where the guides require drawing outward, the rise upon the cam *t*, operates by the means above described, upon the quadrant arm, whereby the excentric plate *s*, is depressed, which forces outwards the arm *r*, and with it the guide bar and guides; and when the threads have been held tight sufficiently long, the elevation on the cam passes away, and a coiled spring pulls the arm *r*, back again, as seen in fig. 2, and with it the guide bar and guides.

The pressing of the beards within the recesses of the needles is accomplished by the action of the cam or tappet wheel and quadrant *s*, just described; for when the said quadrant has nearly reached the extent of its downward motion, it strikes upon the elevated part of a bended arm *v*, affixed to the framing of the presser bar O, (see fig. 4,) and depresses the presser bar, whereby the upper edge of that bar forces the beards within the recesses of the needles. When the action of the presser bar has continued upon the needles long enough to let them pass the net, the cam *t*, ceases to act upon the arm *v*, when a powerful spring operating upon an arm proceeding from the back of the shaft z, causes the presser bar to resume its former position.

The movement of the points for bringing the meshes of the net under the action of the needles, is produced by the cams *w*, and *x*. These cams have over each of them a lever *y*, and *z*, carrying a friction wheel and a link; and these links are respectively connected with the ends of levers, which turn upon short transverse axles or fulcrums (a) in the upper part of the head of the machine, (see figs. 2, 3, and 4.) The opposite ends of these levers act upon other levers (b, c,) turning upon studs, screwed to the inside of the machine head.

The lever (b) bears against the end of the point bar U, and at the time that the cam *x*, on the tappet wheel acts through the medium of the parts just described, the lever is forced outward, and with it the point bar U; the points are by these means drawn out of the work, just when they become clear of the meshes: and before they have done receding, a link connected with the lower end of the lever (b) draws forward a tumbler (d), which tumbler in its vibration presses against a shoulder of the brass lever (e), and elevates it a little. This lever is turned upwards at its end to serve as a rest for an arm (f) proceeding from the point bar, and which the end of that bar slides upon, therefore, when this rest is elevated, the point bar and points are of course elevated also, which must be exactly the distance of a mesh of net.

The elevation upon the cam *x*, now ceases, and the point bar is forced forward again by a spring (g) at its back, and as the arm (f) slides upon the rest which has just been elevated the height of a mesh; the points will be made to enter the row of meshes just above those last occupied, as shown in fig. 8.

When the points have been protruded through the net, so as to be under the edge of the presser bar o, an elevation on the cam *w*, operates through the medium of the parts before described upon the lever (c), and in forcing it outwards draws, by means of a link at its lower end, the tumbler (d) back to its former position.

This enables a strong spring (h) to force down the rest, so that its lower end presses upon the arm *v*, attached to the framing of the presser bar o, and by overcoming the resistance of the large spring, to cause the presser bar to descend. The edge of the presser bar bearing upon the points, depresses them, and with them the net, the depth of a mesh, so as to present the new row of meshes which the points occupy exactly opposite the heads of the needles to be operated upon as before.

The threads of silk, cotton, or other material, are given off from the roller L, by a slight movement, being communicated to the periphery of the ratchet wheel (i) fixed on its end. This roller furnishes the threads for forming the centre part of the stripe, and at the opposite end to that from which it is driven, communicates movement by means of wheel work to the second roller M, which is intended to furnish thread for the selvages of the stripes; and where rows of single stitches unconnected are intended to be wrought, one roller only is necessary.

It now only remains for to show how broad stripes of work may be produced, but the Patentee does not mean to confine himself to any particular plan, as various others may be equally effective. Upon the shaft B, are fixed two spiral worms, the one being a left handed thread, the other, a right handed one. In these worms the ends of a lever vibrating upon a stud in the bolt (k,) are alternately carried along, and cause the said bolt to slide in its staples at the same time. When one of the forks of the lever arrives at the end of its worm, it bears against a slope or inclined plane, which lifts it out of its worm, and depresses the contrary end of the lever into action with the other worm; by these means the bolt (k,) is made to travel to and fro. The said bolt has a notched piece screwed on its upper edge, and on this piece, the horizontal arm of the right angle, lever 1, rests, whilst its perpendicular arm bears against one of the arms of the shaft T, which supports the guide bar.

Thus, when one of the elevations of the bolt (k,) forces up the horizontal arm of the lever (1), the perpendicular one shogs, or gives a lateral movement to the shaft T, and with it the guide bar, whereby the guides are made to operate upon a different set of needles to those which they last acted upon; and thus, the rows of stitches are variously interwoven, and connected with each other, as well as with the net producing different patterns. When the elevations upon the bolt terminates, a spring acting against the shaft T, forces it to slide back to its former place, and with it the guide bar and guides.

The Specification concludes, by saying, lastly,—I wish it to be understood, that I do not confine myself to this particular contrivance, for producing varieties of work, as many others are equally practicable; but, I claim as my invention, the application of needles and guides in the way which they are used in the warp machines, to embroider, or produce upon, or in combination with lace net, and other fabrics, as a foundation, the different varieties of design, or pattern, commonly produced by the well known warp machines.—[*Inrolled in the Roll's Chapel Office, Aug.* 1832.]

Specification drawn by Messrs. Newton and Berry.

To **Anger March Perkins**, *of Harper Street, in the county of Middlesex, civil engineer, for his having invented certain improvements in the apparatus, or method of heating air in buildings, heating and evaporating fluids, and heating metals.*—[Sealed 30th July, 1831.]

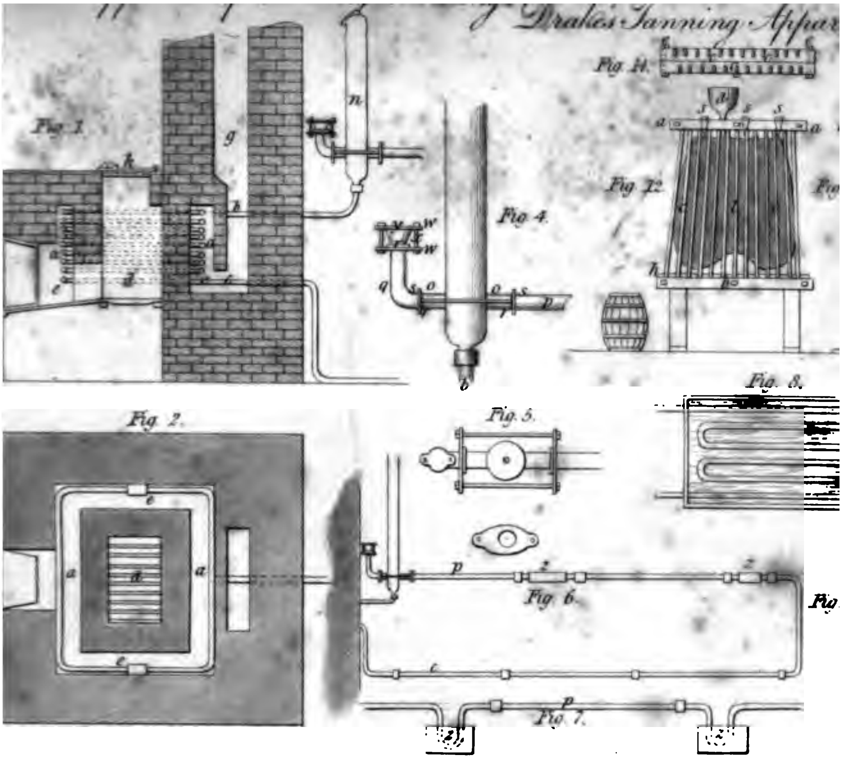
This invention appears to be an improvement upon the apparatus usually employed for warming apartments, warehouses, manufactories, and drying houses, by the circulation of hot water through pipes, from the external surfaces of which pipes the heat radiates, and warms the surrounding atmosphere of the places through which the pipes extend. These improvements are designed to increase the temperature of the water put in circulation; and the apparatus is described as applicable also, to "a variety of purposes which require the heating medium to be higher than that of boiling water."

The Patentee states, that his "improvements consist in circulating water in tubes or pipes, which are closed in all parts, allowing a sufficient space for the expansion of the water which is contained within the apparatus, by which means, the water will at all times be kept in contact with the metal, however high the degree of heat such apparatus may be submitted to, and yet at the same time there will be no danger of bursting the apparatus, in consequence of the water having sufficient space to expand."

Plate II. fig. 1, shows a vertical section of a furnace, such as is proposed by the Patentee to be employed for his purpose; but the particular form of which is not claimed.

Fig. 2, is a horizontal section of the same. The kind of tubes which are found to answer best are those called drawn gas tubing; and the size most commonly to be em-

Drake's Tanning Appar



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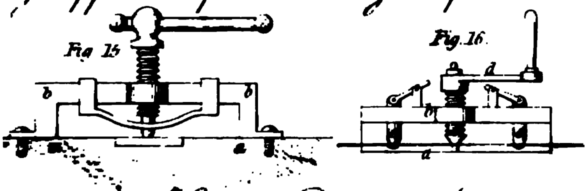
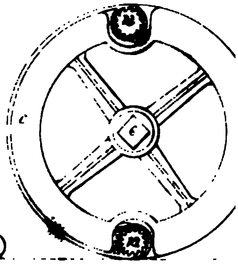
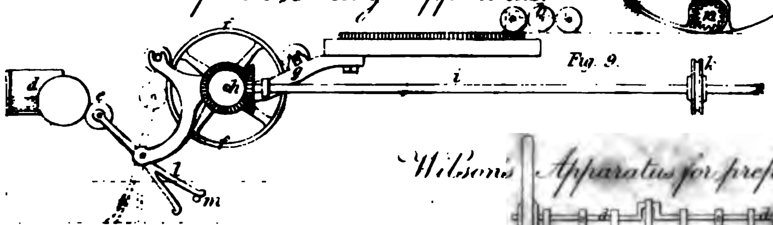
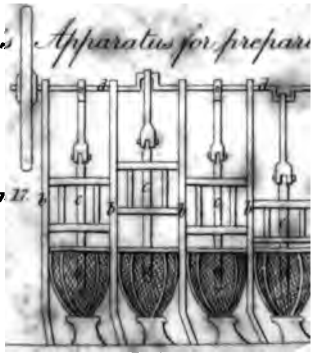




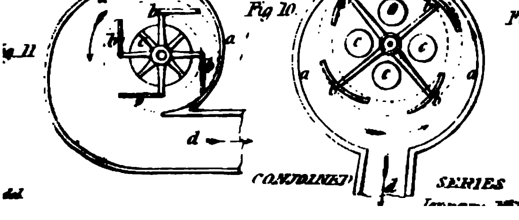
Cowper's Printing Apparatus.



Wilson's Apparatus for prepari



Hale's propelling Apparatus.



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ployed is about one inch outside diameter, that of the inner area being about five-eighths of an inch, but the Patentee does not confine himself to these dimensions.

In these figures *a, a, a,* is a coil of tubing, which is placed within the furnace, as shown in the figure; *b*, is a tube by which the water passes from the coil *a*, when in a heated state, and *c*, is the tube by which the water is returned to the coil, after having given off the heat, to effect the object to which the apparatus is applied; whether for heating the air in buildings, evaporating fluids, or heating metal, as will be more fully described.

The furnace consists of two compartments *d*, and *e*; the compartment *d*, is that in which the fuel is burned, and the compartment *e*, surrounds it, and is a sort of hot chamber, in which the coil of tubes *a*, is placed, and the water therein becomes heated by the fire in the compartment *d*, the smoke and heated air passing from the ignited fuel at *f*, into the compartment *e*, and thence into the chimney *g*.

The description of fuel preferred to be used, is coke, or stone coal, or other coal as free from bituminous matter as possible, which is put into the compartment *d*, at the upper part *h*, over which there is placed at all times a cover, to prevent any draft passing in that direction, by which means, when the fire is lighted and the fuel is filled up to the top of the compartment *d*, and the opening at *h*, is covered, the air to produce the combustion will ascend through the fire bars, and the fuel will in a short time become an ignited mass. The opening or door in the front of the furnace is for the purpose of having the fire lighted and the fuel stoked.

Figs. 3, 4, and 5, show the manner in which the joints of the apparatus are constructed, which are drawn on a larger scale for the purpose of making them more clear; fig. 3, is the section showing the manner of connecting the tubes *k*, and *l*. The end of the tube *k*, is tapered off both inside and out to a sharp edge, which buts against the straight surface of the end of the tube *l*. On the ends of these tubes are cut screws; the one having a right hand screw, the other a left hand screw, and by means of the coupling piece *m*, which has a female screw cut right and left, the two ends of the tubes *k*, and *l*, are brought together, and by this means a strong water tight joint is made. In this manner any number of tubes may be connected together, according to the purpose to which the apparatus is to be applied.

Figs. 4, and 5, are two views of the connexions of other parts of the apparatus, and also of the part of the apparatus which is intended for the expansion of the water; *n*, is an upright tube, closed at the top, having a small screw hole to let out the air when the apparatus is occupied with water, but which is kept perfectly closed when the air is driven out. The tube *n*, is usually made of a larger size than those in which the circulation takes place, and in this tube there should be an area equal to the quantity of expansion which will take place in the water contained in the tubes through which it circulates, and it is said that "*as water expands to about one twentieth without being converted into steam*, I leave at least double that quantity of capacity in the tube or vessel *n*."

Two short tubes *o*, *o*, formed as cones at their ends, enter into the holes perforated in the tube *n*, and into the tubes *p*, and *q*, being the tube by which the hot water is conveyed from the coil *a*, after it has become heated; and the tube or pipe *q*, is the point where the apparatus is filled with water, and by which the height of the water is regulated. This tube *q*, must be placed in such a position that there shall be sufficient space above it in the vessel *n*, to allow for expansion.

On the tubes *p*, and *q*, two collars *r*, are formed, and by means of the two plates *s*, *s*, and the screw bolts and nuts *t*, *t*, a strong water tight joint is produced to all the parts. At the top of the pipe *q*, there is a collar *r*, formed; and by the plates *w*, and screws and nuts *x*, the cone *y*, is strongly held on the opening of the tube *q*, by which the same is made water tight, when the apparatus has been filled.

To the bottom of the expansion tube *n*, is connected the pipe *b*, by similar coupling as that described in fig. 3.

The Patentee says, "Having now described the manner in which I conceive it best to construct the various parts of the apparatus, I will proceed to describe some applications of the same.

Fig. 6, shows a longitudinal view; and fig. 7, shows a plan of an arrangement for applying my improvements to hot plates, which are intended to be used by copper plate and other printers, for the purpose of heating the plates from which impressions are to be taken. I have not thought it necessary to show the presses, or any parts of the machinery used for printing. The plates *z*, *z*, being intended to be used in place of the charcoal fire grates, heretofore employed for heating the plates at the time the ink is being rubbed in. One of these heated plates is placed in the proper position at each press, if more than one is to be heated, and it will be evident that a large number of presses may have their plates heated by one set of tubes. The tube *p*, is the one which, as above described, conveys the heated water from the furnace; and the tube *c*, returns it back to the coils after it has given off its heat.*

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* An apparatus precisely like this for heating copper plates for printing by means of *steam*, was invented about ten years ago, by Mr. Ramshaw, of Fetter Lane, London, and for which the Society of Arts presented him their gold medal. This plan has been in

The manner in which I construct the plates is as follows:—I make a rectangular mould to the size required, and place therein the bent part of the tube *p*, and then fill the mould with melted lead, or other metal, according to the degrees of heat, such plates are intended to bear; by which means I produce metal surfaces, which become heated by the passage of the heated water through the tubes *p*; and it is evident that such heated plates may be applied in a variety of ways, and for a variety of purposes, such, for instance, as hot plates for cooking purposes.

Fig. 8, shows the manner of applying the apparatus to a rectangular boiler, and which boiler is shown in plan, and is applicable to the boiling of syrup, or the making or refining of sugar, by which it will be seen that the heated water is made to circulate through a series of tubes, and give off its heat to the fluid contained in the boiler; or these tubes may be made to pass into steam, or other boilers, in a similar manner, and will cause the fluid contained in such boilers to become heated and evaporated.

In heating the air of rooms or buildings, the tubes *p*, and *c*, may be made to pass around the flooring of such room; and where a large quantity of heat is desired, it will sometimes be desirable to have more than one pipe passing to and from the coil of pipes contained in the furnace, whereby a larger quantity of heated surface will be presented, which being heated to a high degree of temperature, will give off the same to the air contained in the rooms or buildings,

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constant use ever since, and is found to be greatly perferable to the charcoal fire commonly employed; and beside being much more cleanly and wholesome for the workmen, it is found that the engravings last much longer, owing to the face of the copper in Mr. Ramshaw's printing office not being subject to be acted upon by the carbonic acid gas thrown off by the ignited charcoal.

and warm the same; and I have found that when the circulating tubes present a surface equal to three times that of the coil of tubes in the furnace, I have not been able to burst the tubes."

The Specification concludes by saying, "Having now described the nature of my invention, and the manner of carrying the same into effect, I would have it understood that I lay no claim to the various parts of which such apparatus is composed. Neither do I claim the application of the circulation of hot water to the purposes above described; but what I claim as my improvements in such apparatus, or method of heating the air in buildings, heating and evaporating fluids, and heating metal, consist in circulating water in tubes or pipes, which are closed at all parts, and having sufficient space allowed for the expansion of the water, as above described."—[*Inrolled in the Inrolment Office, January* 1832.]

To EDWARD COWPER, *of Streatham Place, in the county of Surrey, and* EBENEZER COWPER, *of Suffolk Street, Pall Mall East, Westminster, in the county of Middlesex, engineers, for their having invented certain improvements on printing machines.*—[Sealed 19th July, 1830.]

THESE improvements apply, in the first instance, to those parts of a printing machine which distribute the ink, and communicate it to the form of types on the table previously to giving the impression; and secondly, to a mode of distending, and occasionally shifting the blanket or cloth which is bound round the pressing cylinder, technically called the set off sheet.

Plate II, fig. 9, represents so much of the apparatus as the Patentees consider to be sufficient to explain their invention, the parts being shown in a detached form, that is without the frame work which carries the machinery or the mechanism by which it is driven; *a*, is the table with the form of types placed upon it; *b*, are the inking rollers mounted upon axles turning loosely,.as usual, in side bearings fixed to the framework; *c*, *c*, *c*, is the pressing cylinder, by which the impression is given; *d*, is the ink trough and ductor roller; *e*, the carrier roller, which takes the ink from the ductor, and gives it to the distributing surface. This distributing surface is formed by a drum *f*, mounted upon an axle, the pivots of which turn in brackets or arms *g*, fixed to the underside of the table, the drum being made to revolve by means of bevel gear *h*.

Rotary motion being communicated to the larger pressing cylinder *c*, *c*, *c*, the ordinary gear connected with it causes the table and form of types to advance, and to pass under the pressing cylinder, which gives the impression of the types to the sheet of paper on the periphery of the cylinder, as it rolls over the table and form.

On the advance of the table *a*, one of the forks of the lever *l*, which carries the roller *e*, strikes against the pin *m*, fixed in the side frame of the machine, and throws the lever over into the position shown in the figure, bringing the carrier roller *e*, into contact with the ductor roller *d*, when it receives its supply of ink; but, on the return of the table, the same pin *m*, throws the lever over again into the other position shown by dots, bringing the carrier roller *e*, into contact with the drum *f*. By these means the necessary supply of ink, is from time to time communicated from the ductor to the drum, and it is there spread over or distributed equally upon the surface of the drum, by a two fold movement, that is by a rotary and a lateral motion given to the drum, through the following mechanical contrivances:—

One of the bevel or mitre wheels *h*, is fixed upon the end of the axle of the drum *f*, the other which takes into it is attached to the end of the lateral shaft *i*. This shaft which is mounted at one end in a bearing fixed to the bracket *g*, is driven by a pulley *k*, mounted upon it, but the shaft is allowed to slide to and fro through the pulley as the table advances or recedes. The pulley is driven by a band or by a gear connected to the pressing cylinder, or to the first moving parts of the machine, and by its rotation, the drum is made to revolve, and to spread the ink which has been deposited upon its surface, the small rollers in contact with it, assisting the distribution; bnt, in order to prevent the ink from laying in stripes or unequal thicknesses round the drum, a lateral or side motion is given to it; this is done by making the edges of the drum irregular or enclined, and placing fixed points for those surfaces to act against, which, as the drum revolves, causes it to slide to and fro upon its axle, and thereby render the distribution of the ink more equal or uniform.

When the table comes forward to give the impression, the drum *f*, proceeding with it, passes under the inking rollers *b*, and communicates to those rollers a supply of ink, which supply of ink as the table afterwards moves to and fro, is deposited by the rollers *b*, upon the surface of the form of types.

The second feature of the improvement, consists in affixing the ends of the " set off sheet," cloth, or blanket, to two rollers *n*, *n*, mounted in recesses formed in the periphery of the pressing cylinder. These rollers turn on pivots, and when the cloth is distended, they are held fast by ratchets and clicks. When the surface of the set off sheet has become soiled by the repeated impressions, the ratchets are to be released, and a clean portion of the cloth is to be brought forward over the surface of the printing cylinder.—[*Inrolled in the Inrolment Office, Jan.* 1831.]

A contrivance of this sort for a set off sheet, was introduced by Dr. Church, as part of his improvements in printing, in 1826, (see Vol. I, of our Second Series, page 144,) which was certainly a better contrivance, because the ratchets and rollers acted by the ordinary movements of the machine, and the sheet was progressively moved forward.

To William Hale, *of Colchester, in the county of Essex, machinist, for his having invented a machine or method of raising or forcing water for propelling vessels.*—[Sealed 12th January, 1830.]

The Patentee proposes by the operation of a peculiar construction of force pump, to send a jet of water out at the stern of a vessel, with sufficient force to cause the vessel to be propelled in the opposite direction, by the recoil, or resistance of the water in which the vessel is floating.

The peculiarity of the pump, consists in placing a series of rotary paddles upon an excentric axle within a circular chamber, or in the centre of a chamber, formed as a convolute curve; the paddles working obliquely, or like the faces of wedges pressing the water out through a discharging aperture; the amount of the obliquity of all the paddles collectively, being exactly equal to the aperture at which the water is to make its exit.

These principles of operation, which are not very evident, and cannot be clearly expressed in words, may be better understood, by reference to the diagram figures in Plate II.

Fig. 10, represents a circular chamber *a, a, a,* into which water is admitted through openings *c, c, c, c,* beneath, in this chamber the axles of the revolving paddles *b, b,* are excentrically situated. The chamber is to be placed horizontally in the lower part of the vessel, with the aperture *d,* for the discharge of water, opening toward the stern. The paddle wheel is intended to turn in the direction of the arrow, and the paddles standing oblique to their respective arms, it is presumed, that as they revolve, they will operate like wedges or inclined planes against the water, pressing it with considerable force through the aperture *d.*

Fig. 11, shows another modification of the same principles: *a, a, a,* is a chamber formed as a convolute curve, intended to be placed in a vertical position; *b, b,* is the rotary paddle; *c,* the aperture in the side of the box to admit water; *d,* the aperture, at which it is to be discharged; as the paddles go round, they will act obliquely against the water, in the same way as described before, and the effect anticipated is, that the water will be ejected from the chamber at the lower aperture *d,* with sufficient force to propel the vessel in the opposite direction.

The means by which these propellers are to be driven is not specified, but a steam engine, or any other first mover, is to be employed.

The Patentee concludes his Specification by saying, "I claim as my invention the machine hereinbefore described, whether applied vertically to raise water or horizontally to force water, as in propelling ships, boats, &c."—[*Inrolled in the Inrolment Office, July,* 1830.

To WILLIAM DRAKE, *of Bedminster, near the city of Bristol, tanner, for his invention of an improvement in tanning hides and skins.*—[Sealed 7th October, 1831.]

THE following is the Patentee's description of this invention:—

This invention consists in causing tanning matter to enter into hides or skins by applying cold tan liquor to one side of the skin, and evaporating, by artificial heat from the other side, a portion of the moisture which oozes through to it, whereby the strongest portion of the tanning matter is left in the hide or skin while the strength of the liquor continually increases during the tanning process instead of becoming weaker, as in the ordinary course of proceeding. By this improved process a hide or skin may be tanned in ten days as completely as it would require ten months to perform by the usual method.

The hides or skins intended to be tanned after undergoing the usual and well known mode of preparation by liming and other processes, are immersed in a weak tan liquor. By frequent and continual handling whilst in this state, they become saturated with liquor, and receive their preparatory colouring before their intended submission to the improved process. The hide or skin being thus cleansed or otherwise prepared, is to be carefully examined. and should any holes be found in it, they are to be sown up or otherwise stopped by means well known, in order to prevent the liquor with which they are intended to be filled from escaping, except through the pores of the hide or skin.

Should it be intended to tan the hides or skins as butts, middlings, or in any other shape than the natural one, the shape which it is intended they shall assume when tanned must be given them at this part of the process by rounding or cutting off the extraneous parts.

Plate II, fig. 12, represents two hides, so prepared as aforesaid, undergoing the improved process of tanning, for it is found that the most economical plan is to perform the operation upon two hides at once. Having procured two hides as nearly of the same size and shape as possible, in order to avoid waste, and prepared them as aforesaid, place them grain to grain and sew their corresponding edges firmly together all round with shoemaker's waxed thread, so as to form a bag sufficiently tight to hold tan liquor, in the same manner as used formerly to be practised when the plan of churning skins made into bags and filled with tan liquor. This bag is hung by means of loops sewed on to the shoulder end of it upon pegs *s*, *s*, *s*, *s*, resting on the bar *a*, as will be better shown in the other figures hereinafter explained.

This bar *a*, which is called the head rail, it will be seen, forms the upper part of the wooden barred rack *a*, *b*, *c*, and at the other side of the hides is a similar barred rack. The bag formed of the two hides as aforesaid being suspended in manner here shown between these two barred racks, the racks are drawn together by the screws *e*, *e*, *e*, sufficiently near to each other to prevent the bag, when filled with liquor, from distending or being stretched out of its proper shape.

It should be stated that about an inch of the bag should be left unsewed at the upper or shoulder end for the purpose of introducing the funnel or tan dish *d*, which should always be kept cool, in order to fill the bag with the cold tan liquor, and it will perhaps be found more convenient to introduce the small collar or ferrel (shown detached below,) into this hole, and sew the edges close up to it in the first instance to facilitate the use of the funnel.

Fig. 13, is a side view in section of the barred racks, with the bag made as aforesaid, of two hides suspended between them upon the pegs, one of which is here shown, marked *s*. These pegs it will be seen merely rest across the top or head rails of the barred racks.

It is only necessary with regard to these barred racks, further to state, that the inner part of the bars should be cut to an edge, and that they should all be hollowed out a little, except the three or four outer bars on each side, which may be straight, for the hides are thicker in that part, technically called the pins, than elsewhere, and therefore require this accomodation till within three or four of the outside, when they may be all straight bars.

The bag being so suspended, and the barred racks screwed up as aforesaid, a funnel or tan dish should be applied to the collar or hole in the upper edge or shoulder end of the bag, and cold tan liquor poured in till the bag is full. After the expiration of an uncertain time, which varies according as the hides are more or less pervious, it will be observed that their external parts will become moist and damp, and the moisture which escapes through the pores of the hides will run down and drop at the lowest point of the hides, and run off into the gutter *h*, which should conduct it into some suitable vessel acting the part of a refrigerator, whence it may be again poured, when cold, into the bag, to supply the deficiency occasioned by this oozing out; for it should be stated that the bag should be kept constantly full of cold liquor, by fresh supplies through the funnel, as occasion may require.

When the hides are observed to feel hard and firm, and every part of them appears equally damp, the air of the tanning apartment in which the hides are operated upon, and which should be furnished with good ventilation to allow the vapour to escape, is to be heated by any artificial means to a temperature gradually increasing from seventy to one hundred and fifty degrees of Fahrenheit. This heat is to be maintained until the hides become firmer and harder in all parts, and when they begin to assume in different parts a blackness of appearance, and the tan liquor in the bag exhibits little progressive diminution in quantity, and the hides are found to be tanned, the liquor is to be let off from the bag by opening a small aperture in the stitches at the bottom or butt end of the bag, which when emptied, is to be removed from tbe racks.

The outer edges of the hides or skins so far as they were sewn together, are to be pared off or rounded, and then they are to be dried and finished in the usual way. Particular care being taken during the time the hides are inclosed between the racks, that they be at different times moved or shifted a little to the right or left from the position in which they are at first placed, in order that the liquor and heated atmosphere may operate on all parts alike; and as it will be seen that the inner edges of the bars of the racks will leave corresponding indentations in the exterior surface of the hides, the shifting or varying of the positions of the hides will be found to have a very useful effect in preventing the indentations from being so firmly imprinted, as to render them incapable of obliteration.

The time required to finish this process from the time the hides or skins are hung up or inclosed between the racks, will vary according to the thickness of the hides or skins, the strength of the liquor used, and the attention paid to the management of the heat, and the shifting of the hides between the bars, together with the other general management which any practitioner of ordinary skill will easily understand.

Fig. 14, represents a sectional plan of the barred rack *b,b*, being the bottom rails, and the parts marked *c*, the bars, which it will be seen, are not placed exactly opposite to each other, but occupy alternate spaces.—[*Inrolled in the Inrolment Office, April,* 1831.]

To MELVIL WILSON, *of Wamford Court, Throgmorton Street, in the City of London, Merchant, in consequence of a communication made to him by a certain foreigner residing abroad, for an improved method of preparing and cleansing paddy or rough rice.*—[Sealed 6th February, 1830.]

THE subject of this Patent is a machine for beating paddy or rough rice for the purpose of cleansing it from its shells or husks. A front elevation of the machine is shown in Plate II, at fig. 17, consisting of four vase shaped sieves *a, a, a, a,* fixed upon pedestals. These sieves are made of gauze wire, for the purpose of sifting the rice from the husks. The vases are held by bent arms, fixed into a rim at the top of each, which keeps them firm.

Perpendicular standards *b, b,* form a frame work, in which guides *c, c,* slide up and down, for the purpose of directing the pestles or beaters on to the central block in each sieve. The upper part of each pestle is connected by a jointed arm to the horizontal crank shaft *b,* and this being driven round by a band and rigger, or by a winch, and its action regulated by the fly wheel, the pestles will be made to rise and fall, and beat the paddy or rough rice in the vases; which operation is to be continued until the husks or shells are all entirely broken, and beaten off from the rice.

The Patentee does not claim the machinery as new, but only the "*lateral sieves,*" as applied to the purpose of preparing and clearing rough rice.—[*Inrolled in the Inrolment Office, August,* 1830.]

To William Parr, *of Union Place, City Road, in the county of Middlesex, gentleman, for his having invented or found out a new method of producing a reciprocating action by means of rotary motion to be applied to the working of all kinds of pumps, mangles, and all other machinery, in which reciprocating action is required, or may be applied.*—[Sealed 18th January, 1830.]

This invention is simply a modification of the well known contrivance for producing a reciprocating motion called "*the mangle wheel,*" which consists of a circular series of pegs, placed round the face of a wheel, into which a tooth or pinion works, and when the pinion has travelled round the series of pegs on their outer circumferenee, it moves inwards through an opening in the range, and takes into the pegs again on their inner circumference, consequently producing by a continued rotation of the pinion, rotary movements of the wheel in opposite directions, which give reciprocating or to and fro movements to the machinery.

The contrivance which is claimed as the subject of this Patent, consists in forming the series of pegs in a straight line, and causing the axle of the driving pinion to work in an endless groove which extends along each side of the row of pegs round its ends. The pinion being put in rotary motion, and its teeth taking in between the pegs, causes the sliding rack or frame of pegs to be driven along until the pinion has reached the end of the range, when it works round the extreme peg, and then coming into operation on the opposite side of the pegs, works the rack or frame of pegs back again, thus producing a reciprocating movement, which is applicable to various kinds of machinery.

This contrivance is so well known as a mechanical agent, and has been modified and applied in such a multitude of ways, that we feel surprised at seeing it now proposed as a new invention.—[*Inrolled in the Inrolment Office, May,* 1830.]

To John Gray, *of Beaumauris, in the county of Anglesea, gentleman, for his invention of a new and improved method of preparing and putting on copper sheathing for shipping.*—[Sealed 4th February, 1830.]

This is merely an apparatus for punching holes in the plates or sheets of copper or other metal intended to be placed on the bottoms of ships, for sheathing. The particular object of the Patentee appears to be to counter-sink the holes in the plates or sheets of metal, so as to admit a portion of the heads of the nails or bolts by which they are fastened to the ship's bottom, and thereby to prevent the uneven surface which the heads of the nails or bolts would present to the water when the sheathing has been attached.

Plate II, fig. 15, shows an apparatus to be fixed by screws or pins to a bench *a, a,* which consist of a bridge *b, b,* carrying a screw punch *c, c.* The lower part of this punch is egg shaped, in order to produce the counter-sunk form of the hole on the upper or outer side of the plate or sheet of metal.

The bench is to have a stout plate of steel, with a hole in it, to receive the end of the punch, and the sheet of copper or other metal having the points at which the holes are to be pierced, carefully marked out, is to be placed upon the bench under the punch; the screw being thus depressed, by means of the winch or lever, at its upper end, a hole is pierced through the sheet of copper, and the upper side of it pressed into a counter-sunk recess by the egg shaped form of the punch.

Another modification of the apparatus is shown at fig. 16, having a lower plate *a*, instead of the bench, which plate is affixed to the upper piece answering to the bridge *b*, in the previous figure; in the middle is the screw punch *c*, and at *d* is the winch or lever for depressing the punch. There are two pieces *e*, *e*, formed like the punch, having egg shaped points, these are made to slide loosely through the bridge, and are raised by small levers. These points *e*, are designed to be inserted into one or more of the holes previously pierced in the sheet, in order to keep it steady, and in its place, while another hole is being punched, which will render the holes all at equal distances.

Plates of copper or other metal having been prepared, by rolling in a mill as usual, and cut to the proper sizes for sheathing, are thus to be punched with series of countersunk holes, and when put on the ship's bottom the heads of the nails or bolts by which they are attached will be nearly embedded in the surface of the sheathing, and render it nearly smooth. [*Inrolled at the Inrolment Office, April,* 1830.]

ADJUDICATION ON PATENTS.

Court of Chancery, before Lord Chancellor Brougham.

HENSON *v.* ALCOCK.

The proceedings in this case arose out of a caveat lodged at the Great Seal Office, on behalf of William Henson, of Worcester, against sealing any patent to Thomas Alcock, of Claines, near Worcester, for improvements in machinery for making bobbin net lace.

Caveats are commonly entered at the Attorney or Solicitor General's offices, and occasionally at the Bill Office, against Patents to be granted to any parties for inventions applicable to any particular object which is named in the caveat. These caveats frequently bring the applicant for a patent, and the opponent claiming the caveat, to a hearing before the Attorney or Solicitor General, who examines each party separately and in private, as to the leading features of their respective inventions, which are usually explained to him by models or drawings; and from a comparison of the two plans, the Attorney or Solicitor General determines whether or not the two inventions are alike; if they are alike, he refuses to *Report* upon the *Petition* of the party soliciting a patent, and the process to obtain the patent can proceed no further; but if the inventions are decidedly different, then the patent is allowed to go on.

It has also been a practice (though rarely resorted to) of entering caveats against any particular patent at the Privy Seal and Signet Offices, and also at the Lord Chancellor's Great Seal Office; but it has been considered improper and vexatious to stop a patent in these advanced stages—the opposite parties having had the opportunity of calling for a hearing and decision on their respective claims in the earlier stages of its progress.

The investigation before the Lord Chancellor, in the present instance of Henson against Alcock, has fully established the fact of *right*, which any party may claim to arrest the progress of a patent, even in this last stage, by opposing it under a caveat at the Great Seal.

It is however to be observed, that such oppositions are discountenanced by the Chancellor, and are only to be resorted to under circumstances of strong suspicion that the invention sought to be secured by patent right has been improperly obtained by the party soliciting the grant, and is in fact a piracy and infringement upon the invention of the opposing party.

In this instance Thomas Alcock is represented as the nephew of William Henson; and the latter states, upon affidavit, that he has considerable reason to believe that the invention for which Thomas Alcock is soliciting His Majesty's Royal Letters Patent in England for improvements in machinery for making lace, is in fact the invention of the deponent, which he had unguardedly communicated to his nephew in confidence, and of which he is now endeavouring to deprive him by claiming the improvements in lace machinery, as his, Thomas Alcock's, own invention.

It was argued by the Counsel for Alcock that Henson had no right to enter a caveat, at the Great Seal—that the time had gone by for opposing, after the Attorney General had issued his *Bill*, but the Lord Chancellor found there were several precedents of caveats against patents having been argued before the Court of Chancery, he therefore determined that Henson had a right to oppose Alcock's patent at that stage.

The Lord Chancellor said, "I cannot look at this case and deny that they (the agents of Henson) have a strict right to be here, but it is a right which must be exercised very sparingly, and a discretion must necessarily be vested in the Court. In the very peculiar circumstances of this case I am disposed to give them the benefit of it, exercising it in a somewhat roundabout way, by sending it to the Attorney-General; but the very circumstance upon which that suspicion rests, leads me to reserve the queston of costs."

His Lordship at first proposed to hear both parties in Court, as Lord Eldon had done in a former case of a similar kind, but ultimately considered the best course would be to refer the invention of Alcock back to the Attorney General for him to hear both parties, and to determine whether the inventions were the same, or dissimilar, as he would do in ordinary cases of opposition, before issuing his *Report*.

In order to avoid any other caveats which might be entered at the Great Seal against this patent, before the Attorney General's decision was returned, and to prevent other parties who might have patents for improvements in lace machines, from obtaining the seal and a prior date to that of the present applicant, it was agreed that, in the event of the patents of Alcock (for there were two under similar titles) being ultimately sealed, they should bear date on the day that they were first delivered at the Great Seal Office.

As a difficulty arose as to the precise form in which the patent was to be again brought before the Attorney General, the Council proposed that "all the parties go before the Attorney General to see whether the inventions are the same." The Lord Chancellor added, that "it is in the nature of an inquiry before the Attorney General to assist the conscience of this Court, to see whether the sealing shall go." Council:—"Then let the Attorney General report whether the patent shall be granted, and whatever is produced before the Attorney General should be the same as that which is afterwards inrolled as the specification."

After submitting the subjects to a hearing before the Attorney General, it was directed that the two patents of Alcock against which the caveat was entered, should be sealed, as the improvements were dissimilar to those of Heuson, and not infringing upon his inventions. The matter was therefore referred back to the Chancellor only, the subject of costs of suit which, of course, fell upon the opponent, as he had not made good the plan upon which he entered his opposition.

COURT OF EXCHEQUER, WESTMINSTER.

Brooke and Hargrave v. *Ripley and Ogle.*

(Before the Chief Baron Lyndhurst.)

THIS was an action for damages brought by the plaintiffs, Messrs. Brooke and Hargrave, clothiers, of Kirkstall, near Leeds, as Patentees of an improved machine for scribbling and carding wool, against Messrs. Ripley and Ogle, of Leeds. clothiers, for using their improved process and imitating their machine for scribbling and carding wool.

The specification of the Patent which formed the subject of the present action will be found described in the 12th Vol. of the First Series of the London Journal of Arts, page 269. The improvement consists in applying steam boxes, under the cylinders of the carding engine, for the purpose of warming the wool during the carding and scribbling process.

It appeared by the employment of these heating boxes a very short fibre of wool, and that of a refuse quality, was enabled to be worked up into a very fine kind of ladies' cloth called by the Patentees *Indianas,* resembling and indeed surpassing in softnesss the cashmere and merinos of foreign production.

The plaintiffs case was led by Serjeant Merryweather, who, after proving the patent right, placed in the witness box, an illiterate working mechanic to testify that he had never before the invention of the plaintiff's seen heating boxes so applied to scribbling and carding wool. Mr. Pollock, who appeared for the defendants, handed to the witness a copy of the plaintiff's specification, which he could with difficulty read; on having his attention directed to the description and drawing of an appendage to the scribbling engine, which was an excentric movement, for stroking down the fibres of long wool upon the cylinder, when the machine was applied to the preparation of worsted, there appeared to be some ambiguity in the description which the witness could not understand; the council for the defendants objection to this part of the specification, as not sufficient for an ordinary working man to comprehend, and though there were many witnesses in court who perfectly understood the intention of the Patentees by their Specification, yet it was held that scientific persons could not be called to make that clear which a working mechanic could not comprehend.

The jury desired to hear more evidence upon the point before they could agree to consider the plaintiff's case lost but Mr. Pollock insisted that as a point of law the specification being bad the patent must fall, and the court allowed the plaintiffs to be nonsuited.

We had indulged a hope that from the liberal views latterly taken by the Court of King's Bench, in cases of pirating patent inventions, that patent rights had begun to obtain greater security than formerly; but of all the severe decisions of the courts which have come to our knowledge, this is the most extraordinary. Had the case been gone into, and there had been proved to be some palpable error in the Specification, for want of novelty in the claims, it might have been some satisfactory reason for breaking down a vested right, under which the Patentees had laboured for years, and had at length suceeded in producing a new and valuable article of manufacture never before known in these kingdoms; but the claim of a point of law, which had not been satisfactorily established by a point of fact, is a case that we hope never again to see triumphant in our courts of judicature.

There perhaps never was a subject which more loudly called for a revision of the Patent Laws than the decision above stated, and we sincerely hope that many months will not pass over us without the serious attention of the legislature to the protection of this important part of the rights and privileges of the people, the protection of that inventive genius and perfection of our art, by which the manufactures of our country have been raised to a pinnacle of greatness viewed with envy and astonishment by all other nations. The Specification was drawn by a learned gentleman at the bar!

LITERARY NOTICES.

A Memoir on Suspension Bridges. By E. S. Drury, Civil Engineer. 8vo. pp. 212, with Plates.

This work which is written in a very clear and perspicuous style, contains a very considerable store of information, and we may add amusement, for such it has appeared to us. The subjects comprehended in its pages are, first, a history of the origin and progress of Suspension Bridges, and of their application to civil and military purposes. This is followed by descriptions of some of the most important bridges which have been erected upon the suspension principle, (viz.) those of Menai. Berwick, Newhaven, Brighton, the Isle of Bourbon, Hammersmith, Bath, Marlow, Shoreham, Pont des Invalides at Paris, Pont d'Arcole, Jarnac, Tournon, and Geneva.

The descriptions of these structures are accompanied by plates showing their general appearance, and also the peculiarity of parts of which they are formed, and accounts of many experiments are given which have been made with reference to the strength of iron in the various forms of bars, rods, and chains, with tables and rules for calculating the weights and substances of that material suited to the erection of such structures.

Mr. Drury has evinced in this production considerable knowledge of his subject, and though the work may be considered for the most part an association of other people's ideas and projects, yet they have been by him brought into that compact form, and accompanied with so many useful remarks and collateral scraps of information, that we have no hesitation in pronouncing the "Memoir," or we should rather say Treatise on "Suspension Bridges" as a valuable acquisition to the library of every scientific man, and have no doubt that many of its pages will be read with considerable interest and satisfaction by those who have little pretention to science, but are admirers of genius and the works of art applied judiciously to the service of mankind.

AMERICAN PATENTS.

For a *Thrashing Machine;* William Emmons, city of New York, February.

This contains all the usual appendages of thrashing machines. The teeth upon the cylinder are to be in rows, and from 1 to 1½ inches long. They are to be bent back so as to form a semicircle, declining from the grain. The hollow segment is to be borne up by spiral springs. The claims are to "the peculiar construction of the cylinder, in contra-distinction from any other before known. The form of the teeth turning back in a semicircle. The form and construction of the circular bed, with the teeth, and the manner of setting it on springs.

For a *Thrashing Machine;* Truman Fox, and Wm. G. Borland, Little Falls, Herkimer county, February 8.

We have again a thrashing machine of the ordinary form, with the addition, however, of a fly wheel, which is an appendage not attached to the whole of them; nor is it necessary when the cylinder is weighty and has a very rapid motion.

"What we claim is the construction of the receding concave, by means of springs, or lever and weights, and the staple teeth, and the fly or balance wheel."

The teeth are formed of wire, and bent so as to drive in at both ends, like a staple: this, we believe, is new, but the other parts claimed have so many previous claimants, that it is impossible to designate the true and original owner, though we can with some confidence say who is not so.

For a *Reaction Water Wheel*, for impelling saw mills and other works; Joseph C. Strode, East Bradford Township, Chester county, Pennsylvania, February 8.

For Improvements in the *Printing Press:* Amos Sherman, City of New York.

The cheeks and cross timbers of this press resemble those in common use. The platten is worked by a toggle joint, and borne up by spiral springs in the manner of many of the modern presses. The handle, or lever, is fixed upon the middle of the near cheek, and when the platten is raised, its position is nearly vertical. The pull is downwards, which the Patentee says is the most advantageous way of working. There is a mortise made through the cheek, through which a rule joint passes, and upon this the lever acts, which operates upon the toggle joint.

The press is double, having a form, inking apparatus, frisket, and other appendages on each side of the platten. There is a rounce also on each side, as it is intended to employ two men to work the press, and two girls to attend to the sheets. The two parts are connected by iron bars, which can be removed, and the press worked as a single press, when desired. The claims are in the following words:—

"First, I claim that part of the press as I have described it, forming a single combination; its main parts consisting of the bar handle, the two upright pieces, and the two horizontal pieces. I do not claim the bar handle, nor either of the four pieces abstractedly, but I claim the bar handle as used by me in its upright position, that position being the easiest for working. I claim the bar handle and near horizontal piece as united by me by the joint; regard being had to their relative situations and the purpose they serve. I claim the two upright pieces and farther horizontal piece, as they are moved by the near horizontal piece, and as the further horizontal piece is united to the near horizontal piece. I do not claim the toggle joint abstractedly, but I claim it as constructed and moved in the peculiar manner I have described it, with the horizontal piece between the two upright bars.

" Second, I claim the cylinder for winding up the blanket, not abstractedly, but for this purpose, and also for drawing out the frisket. I claim the roller with its bellying form, inserted in the cylinder, and the channel in which it revolves, and the union of the roller and cylinder for the purposes which they serve. I claim the blanket, not abstractedly, but as made in one piece, and placed as I have described it, held at one end by the rollers, and at the other by the lath. I claim the lath with its bellying edge, for the purpose of holding and straightening the blanket. I claim the guides of the lath for the purpose which they serve in being forced towards the platten by the frisket guides, and forcing the frisket guides from the platten. I claim the hooks on the corners of the bed, the guides on the corners of the frisket, and the ways containing channels in which the rollers run, as I have described them, and for the respective purposes which they answer in carrying in the frisket and blanket. I claim also the ways containing grooves in which the guides of the lath and frisket run for that purpose.

" Third, I claim the union of two beds in one press, pressed alternately by a single platten; and the union generally of the two halves of the press, for the purposes for which they are united. I claim the bar uniting the two beds, and the arrangement of the tail irons between the beds, to prevent the tail irons from interfering.

For an Improved *Pendulum Churn*: Caleb Angevine, City of New York.

The churn is the common dasher churn, the rod of which is to be worked up and down by a pendulum. A frame is to be made, across the upper part of which there is to be a shaft turning upon gudgeons; from this hangs a weighted pendulum. The shaft is crossed by a lever, one end of which is attached to the dasher rod; from the other a pitman descends to a treadle. The pendulum may be made to vibrate by the hand; or the foot may be placed upon the treadle for the same purpose. The claim is to " the application of the pendulum principle to the dasher, which equalizes the power applied, and assists in passing the reacting points in the rise and fall of the dasher, and also in the application of the foot power, which relieves the arms and chest in the act of churning."

We apprehend that this machinery would be improved by removing the frame, the shaft, the pendulum, the pitman, and the treadle, and taking hold of the dasher by the hands, as dairy maids have been in the practice of doing from time immemorial.

New Patents.

GRANTED IN ENGLAND IN 1832.

To Thomas Todd, of Kingston-upon-Hull, shipping agent, for his invention of certain improvements in machinery or apparatus for raising water and other liquids.—Sealed 24th November,—6 months for Inrolment.

To George Rudall and John Mitchell Rose, both of the Piazza, in the parish of St. Paul, Covent Garden, flute manufacturers and co-partners, for their invention of certain improvements on, or in the construction of flutes.—Sealed 27th,—6 months.

To Thomas Howard, of Copthall Court, late of New Bond Street, in the City of London, merchant, for his improvements on his former invention, denominated the vapour engine, and the application of a part or parts thereof, with certain additions or improvements to steam engines.—Sealed 29th November—6 months.

To Robert Cattle, of Grove House, in the county of York, Esquire, and William Greaves North, of the suburbs of the city of York, Gentleman, for their invention of an improvement in the construction of fire engines.—Sealed 4th December—6 months.

To William Ranger, of Brighton, in the county of Sussex, builder, for his invention of a cement or composition which he denominates Ranger's Artificial Stone.—Sealed 4th December—6 months.

To Julien Frederic Maillard Durneste, of Paris Street Lambeth, in the county of Surrey, professor of chemistry, for his invention of a machine to reduce caoutchouc or Indian rubber into elastic thread, calibered of different sizes.—Sealed 4th December—2 months.

To John Hornby Maw, of Aldermanbury, in the city of London, surgical instrument maker, for his invention of certain improvements in the form and arrangement of parts of an apparatus for injecting enemata.—Sealed 17th December—6 months.

To Joseph Hardwick, of Liverpool, gentleman, for his invention of certain improvements in paddle wheels.—Sealed 17th December—6 months.

To George Frederick Muntz, of Birmingham, metal roller, for his invention of an improved manufacture of bolts, and other the like ship's fastenings.—Sealed 17th December—6 months.

To John Langham, of Leicester, bobbin net lace manufacturer, for his invention of improvements in machinery for manufacturing bobbin net lace.—Sealed 17th December—6 months.

To William Crofts, late of Lenton, but now of Radford, both in the county of Nottingham, frame-smith, for his invention of certain improvements in machinery for making lace or net, commonly called bobbin net lace.—Sealed 18th December—6 months.

To Thomas Alcock, of the parish of Claines, in the county of Worcester, lace manufacturer, for his invention of certain improvements in machinery for manufacturing bobbin net lace.—Sealed 8th December—6 months.

To Thomas Alcock, of the parish of Claines, in the county of Worcester, lace manufacturer, for his invention of certain improvements in machinery for manufacturing bobbin net lace.—Sealed 8th December—6 months.

To Thomas Parsons, the Younger, of Furnival's Inn, Gentleman, for his invention of certain improvements on locks for doors, and other purposes.—Sealed 20th December—6 months.

To Joseph Saxton, of Sussex Street, in the county of Middlesex, mechanician, for his invention in propelling carriages, and in propelling vessels for inland navigation.—Sealed 20th December—6 months.

To Robert Selby, of Burleigh Street, Strand, in the county of Middlesex, wine merchant for invention of certain improvements in the making or constructing of bedsteads, sofas, couches, and other articles for ease or repose.—Sealed 20th December—6 months.

To William Gutteridge, of the Minories, in the borongh of the Tower Hamlets, civil engineer, and George Stevens, of Norwood, in the county of Surrey, sugar refiner, for their invention of an apparatus for the manufacture and refining of sugar, and other extracts, and applicable also to other purposes.—Sealed 21st December,—6 months.

To William Henson, of Worcester, lace manufacturer, for his invention of certain improvements in machinery for manufacturing bobbin net lace.—Sealed 26th Dec. 6 months.

To William Henson, of Worcester, lace manufacturer, for his invention of improvements in machinery for producing lace in narrow breadths with edges or quilling.—Sealed 24th Dec. 6 months.

METEOROLOGICAL JOURNAL,

FOR 1833.

1832.	Thermo.		Barometer.		Rain in inches.	1832.	Thermo.		Barometer.		Rain in inches.
	Hig.	Low	Hig.	Low.			Hig.	Low	Hig.	Low.	
Nov.						Dec.					
26	48	34	29,63	29,52	,35	11	48	30	30,35	30,27	
27	43	28	29,62	29,42	,025	12	47	35	30,35	30,29	
28	44	31	29,61	29,54	,2	13	47	33	30,19	30,05	
29	45	34	29,56	29,52	,2	14	47	31	29,87	29,81	
30	45	30	29,75	Staty.		15	44	30	29,69	29,56	,05
Dec. 1	56	42	29,72	29,64	,175	16	41	25	29,85	29,79	,5
2	57	50	29,52	29,42	,075	17	56	34	29,62	29,47	,125
3	57	37	29,49	29,39	,05	18	45	37	29,54	29,39	,025
4	47	41	29,89	29,45	,075	19	39	27	29,64	29,57	
5	43	32	30,13	30,06		20	37	27	29,92	29,75	
6	47	34	30,06	29,98	,2	21	46	27	29,65	29,68	,025
7	43	33	30,24	30,14		22	51	39	29,70	29,68	,025
8	44	32	30,29	30,24		23	52	40	29,67	29,64	
9	47	35	30,30	Staty.		24	49	41	29,93	29,35	
10	49	34	30,29	30,24		25	48	40	29,82	29,73	,025

Edmonton. CHARLES HENRY ADAMS.

Latitude 51° 37 32 N.

Longitude 3 51 West of Greenwich.

ASTRONOMICAL OBSERVATIONS.

Meteor.—On Thursday, the 13th, about a minute before 6, in the evening, a remarkably brilliant Meteor made its appearance, in or near the zenith; it proceeded in a southerly direction through Andromeda and Pegasus; then entering Aquarius, disappeared at an altitude of 30 degrees above the horizon; from this point to within 20 degrees of the zenith, a train of apparently innumerable stars was visible for more than 2 minutes after the disappearance of the meteor. The sudden transition, from comparative darkness to a light equalling that of mid-day, produced an extraordinary effect upon the minds of those who witnessed it. A friend, who happened to direct his eye towards the zenith before the Meteor appeared, says, "that from the larger ball of light smaller ones were discharged in various directions, for a moment only previous to its moving."

Charles Henry Adams.

Edmonton.

Latitude 51. 37. 32. N.
Longitude 6. 51. W. of Greenwich.

Eclipses.—January 1. A partial Eclipse of the Moon, visible at Greenwich. Beginning of the Eclipse, 6 h. 48 m. 33 sec. A. M. Middle 7 h. 59 m. 14 sec. Moon's lower limb sets 8 h. 1 m. 2. sec. End of the Eclipse 9 h. 9 m. 54. sec. mean or clock time. At York, the Eclipse begins at 6 h. 44 m. 6 sec., and the Moon's lower limb sets at 8 h. 15 m. 17 sec. At Paris, the beginning and end are 6 h. 57 m. 56. sec, and 9 h. 14 m. 48 sec. respectively. Digits eclipsed 5. 45. on the ☽ northern limb. January 20. an Eclipse of the Sun invisible here. It will, however, be central and annular in many parts of the southern hemisphere, and very interesting at Port Jackson, Van Dieman's Land, &c.

CELESTIAL PHENOMENA, FOR JANUARY, 1833.

D.	H.	M.	
1	0	0	Clock before the ☉ 3 m. 56 s.
1	0	0	☉ rises 8 h. 8 m. sets 4 h.
1	0	0	☿ R. A. 17 h. 42 m. dec. 20. 11. S.
1	0	0	♀ R. A. 21 h. 30 m. dec. 16. 44. S.
1	0	0	♂ R. A. 3 h. 13 m. dec. 20. 8. N.
1	0	0	♃ R. A. 11 h. 57 m dec. 4. 6. S.
1	0	0	♄ R. A. 11 h. 57 m. dec.
1	0	0	♅ R. A. 21 h. 17 m. dec. 16. 33 S.
1	0	0	Vesta R. A. 16 h. 1 m. dec. 15. 50. S.
1	0	0	Juno R. A. 14 h. 52 m. dec. 9. 4 S.
1	0	0	Pallas R. A. 23 h. 49 m. dec. 14. 20. S.
1	0	0	Ceres R. A. 2 h. 8 m. dec 6. 11. N.
1	4	0	♀ in conj. with γ in Capricornus.
1	6	53	☉ in Perigee.
2	2	5	☽ in conj. with ♂ long. 22 in Taurus, ☽ lat. 2. 6. N. diff. of lat. 5. 49.
3	5	20	♃ first sat. will emerge.
4	0	0	☿ stationary.
5	0	0	☽ eclipsed, partly visible, see note.
5	0	0	Clock before the ○ 5 m. 46 sec.
5	0	0	☉ rises 8 h. 7 m. sets 4. h. 3 m.
5	0	0	☽ rises 3 h. 27 m. p. m. sets 6 h. 46. A. M.
5	19	45	Ecliptic opposition or ○ full moon.
6	0	0	☽ in Perige.
6	7	27	Jup's third satellite will emerge.
7	0	0	Mars Stationary.
10	7	16	Jupiter's first sat. will emerge.
10	0	0	Clock before the ☉ 7 m. 54 sec.
10	0	0	○ rises 8 h. 5 m. sets 4 h. 11. m.
10	0	0	☽ rises 9 h. 54 m. P. M. sets 10 h. 43 A. M.
10	18	10	☽ in conj. with ♄ long. 12. 46. in Libra, ☽ lat. 4. 47. N. ♃ lat. 2. 16. N. diff. of lat. 2. 31.
12	11	27	☽ in □ or last quarter.
15	0	0	☿ elong. max W. 24. 1.
15	0	0	Clock before the ☉ 9 m. 47 sec.
15	0	0	☉ rises 8 h. 2 m. sets 4 h. 18 m.
15	0	0	☽ rises 2 h. 52 A. M. sets 0 h. 39 m. P. M.
15	0	0	Venus R. A. 18 h. 5 m. dec. 22. 2. S.
15	0	0	♀ R. A. 22 h. 34 m. dec. 10. 30 S.
15	0	9	Mars R. A. 3 h. 23 m. dec. 20. 48 N.
15	0	0	Jupiter R. A. 23 h. 43 m. dec. 3. 9 S.
15	0	0	Saturn R. A. 11 h. 56 m. dec. 2. 53 N.
15	0	0	♅ R. A. 21 h. 20 m. dec. 16. 19. S.
15	0	0	Vesta R. A. 16 h. 29 m. dec. 17. 8. S.
15	0	0	Juno R. A. 15 h. 6 m. dec. 9. 21. S.
15	0	0	Pallas R. A. 0 h. 4 m. dec. 13. 26. S.
15	0	0	Ceres R. A. 2 h. 13 m. dec. 7. 42. N.
18	5	24	☽ in conj with ☿. long. 5. inCapricornus ☽ lat. 1. 45. N. ☿ lat. 57 N. diff. of lat. 48.
19	17	29	☉ enters Aquarius.
20	6	33	Jupiter's second sat. will em.
20	0	0	☉ eclipsed invisible.
20	0	0	Clock before the ☉ 11m 24sec.
20	0	0	☉ rises 7 h. 57 m. sets 4 h. 27 m.
20	0	0	☽ rises 7 h. 44 m. A. M. sets 4 h. 2 m. P. M.
20	9	33	Ecliptic conj. or ● new moon.
21	10	0	☽ in Apogee.
24	0	0	Venus in the South node
24	7	28	☽ in conj. with ♀ long 15. in Pisces, ☽ lat. 4. 9. S. ♀ lat. 53. S. diff. of lat. 3. 16.
25	0	0	Clock before the ☉ 12 m. 42 s.
25	0	0	☉ rises 7 h. 51 m. sets 4 h. 35 m.
25	0	0	☽ rises 10 h. 3 m. A. M. sets 9 h. 21 m. P. M.
25	3	10	☽ in conj. with ♄ long. 26. in Pisces ☽ lat. 4. 41. S. ♃
26	5	37	Jupiter's first sat. will emerge
28	12	24	☽ in □ or last quarter.
29	22	30	☽ in conj. with ♂ long. 27½ 0 m. Taurus, ☽ lat. 4. 26. S. ♂ lat. 2 10. N. diff. lat. 6. 36.

Mercury may be seen in the eastern horizon a little before the sun rises on or about Jan. 15.

J. LEWTHWAITE Rotherhithe.

THE

London

JOURNAL OF ARTS AND SCIENCES

AND

REPERTORY

OF

PATENT INVENTIONS.

No. X.

CONJOINED SERIES.

Recent Patents.

To EDWARD GARSED, *of Homerton, in the parish of St. John Hackney, in the county of Middlesex, gentleman, and* ALFRED ROBINSON, *of Mile End, in the parish of St. Dunstan, Stepney, in the said county, merchant, for their having invented certain improvements and apparatus for heating, warming, and ventilating, drying houses, rooms, buildings, ships, and mines.*—[Sealed 22d June, 1832.]

THESE improvements consist in the peculiar construction of a stove or furnace, with air passages, by which the Patentees, are enabled to obtain a very rapid circulation of air, heated to any degree of temperature that may be desired, for the warming of apartments, or the drying of goods.

This apparatus is formed by the arrangement of several series of hollow tubes through the interior of which the atmospheric air is allowed to pass, while the external surfaces of the said tubes, are acted upon by the flames, and heated vapours of the furnace and flues by which they are surrounded. Plate III, shows the furnace or stove with its air tubes in several views. Fig. 1, is a front elevation of the stove, having two fire doors closing the mouth of the fire places. Fig. 2, is a longitudinal section of the interior of the stove, supposing the front part of fig. 1, to be removed, in which four ranges of tubes *a, b, c, d,* are seen, each range consisting of a series of tubes placed side by side in a horizontal direction. Fig. 3, is a horizontal view of the stove, supposing the top to be removed, and the upper range of tubes *d, d, d,* to be exposed to view, and also a small part of the second range of tubes *c, c.* Fig. 4, is a section of the stove taken transversely, in which all the tubes composing the several ranges are seen, and the zig-zag direction of the flue leading from the furnace, formed by the positions of the tubes.

The distinct tubes (which are of cast iron) with blocks formed at their ends, are piled upon each other in the way shown in figs. 2 and 4. Fire bricks, or bars of iron, might be introduced between the blocks of each range, for the purpose of increasing the capacity of the flues if desired; these tubes are hollow, as seen at fig. 4, and are open at each end for the free passage of atmospheric air. The air to be heated may be conducted by any convenient means to one end of each tube, and may be allowed to discharge itself from the reverse end of the tube into a hot air chamber, which may have pipes leading to the place intended to be warmed; or conducting channels may be formed as at *e*, fig. 2, leading from the open atmosphere, which may supply the boxes *f*, and *g*, with cold atmospheric air. From these boxes the air will pass into the tubes, as shown by the arrows, and having become heated in its progress through the tubes by the heat of the furnace and flues surrounding them, the air escapes at the opposite ends of the tubes, as shown by the arrows, into the apartment in which the stove is erected.

In the event of its being found most convenient to erect the stove near the middle of a building, it will be desirable to drive the heated air towards both ends, for which purpose the two air boxes *f*, and *g*, are placed at opposite sides of the stove, each to supply a portion of the tubes with air, as shown in the horizontal view, fig. 3, which causes the air to pass off from one half of the tubes towards the right hand end of the building, and from the other half of the tubes towards the left hand.

The front and back plates of the stove are secured together by bolts and nuts, as at *h, h, h, h*; but the Patentees do not confine themselves to this particular mode of constructing the stove, as it may be formed of fire brick instead of iron, neither do they confine themselves to the number of tubes employed in each range, nor to their dimensions, nor to the number of ranges of tubes constituting the entire stove, nor to the thickness or quantity of the materials of which it may be found convenient to make the tubes, though they prefer to have those tubes of greatest substance which are nearest to the fire.

"We claim the arrangement of hollow tubes open at both ends, placed in horizontal series within a furnace or stove, on the external surfaces of which tubes the flame and heated vapours act for the purpose of creating a rarification within, by which a rapid current of atmospheric air is carried on and heated in its progress, and discharged at a high degree of temperature; and it is scarcely necessary to say that the means by which we regulate the degree of temperature of the air emitted from the tubes, is by increasing and diminishing the aperture of the chimney of the furnace, which is done by a damper, as usual."—[*Inrolled in the Rolls Chapel Office, Dec.* 1832.

Specification drawn by Messrs. Newton and Berry.

To JOSEPH GIBBS, *of the Kent Road, in the county of Kent, engineer, and* WILLIAM CHAPLIN, *of the Adelphi, in the county of Middlesex, coach maker, for their invention of certain improvements in wheeled carriages, and in the means of constructing the same.*—[Sealed 8th March, 1832.]

THE principal object of this invention appears to be the construction of a four wheeled carriage which shall be enabled to turn within a small compass, by throwing the axles of all the four wheels simultaneously into different positions; this is done by mounting each wheel upon a separate jointed axle, and connecting all the axles either by jointed rods or chains, with the pole and splinter bar in front of the carriage.

In Plate III, fig, 5, shows an edge view in elevation of two of the carriage wheels *a*, with the short axles *b*, upon which they revolve. This short axle *b*, is formed by an arm extending from a vertical shaft *c*, which slides up and down, and also turns in eyes or loops *d*, *d*, affixed to the body of the carriage *e*; at the lower end of this shaft *c*, is attached a lever *f*, by which the shaft and the wheel may be turned horizontally.

The several wheels of the carriage are to be mounted in this way upon short axles, which extend from vertical shafts sliding and turning in loops or eyes on the sides of the carriage body, as described, and the carriage itself is not supported by the axles, but bears upon the ends of the springs *g*.

Fig. 6, is a horizontal view of the carriage, with its wheels, axles, and levers, in which the method of changing their positions will be seen. The body of the carriage is supposed to be removed, and only a rectangular frame *h, h, h, h*, shown, which forms the bottom or platform for the body of the carriage to bear upon.

The splinter bar *i, i*, with the pole of the carriage *j*, are connected to a parallel bar or lever *k*, which together turn horizontally upon a pivot in a staple *l*, extending from the under side of the carriage, and from the two extremities of this lever the chains *m*, and *n*, pass to the ends of the guide levers *f, f, f, f*, to which they are severally made fast, and also to another parallel lever *o*, turning upon a pivot in the hinder part of the carriage.

The parts being so arranged and connected, when it is desired to turn the carriage, the pole with the splinter bar are, by turning the horses' heads as usual, inclined to one side, as shown by dots. This movement causes the parallel levers *k*, and *o*, to draw the chains *m*, and *n*, and consequently to move the levers *f, f, f, f*, into the situations shown by dots. These levers of course turn the perpendicular shafts *c*, and with them the short axles *b*, and the wheels *a*, into the positions represented by dots, which is equivalent to locking the wheels, when the carriage traverses in a curved direction, or describes a segment of a circle ;

and the action of the carriage upon the springs will cause the shafts *c*, to slide up and down in their staple.

The Patentees propose, under some circumstances, in place of the chains, to employ jointed levers and sliding rods to be severally attached to the ends of the parallel levers *k*, and *o*, and to the guide levers *f*, *f*, *f*, *f*, for the purpose of changing the positions of the wheel; this however embodies precisely the same mechanical principles, and therefore need not be represented by a distinct figure. —[*Inrolled in the Inrolment Office, September*, 1832.

An Invention very nearly resembling the above was the subject of a Patent granted to Mr. R. Ackermann, in January, 1818, "for improvements on axle-trees applicable to four-wheeled carriages." The guide levers, or as they are there termed, "the controlling rods," act only upon the fore wheels, turning their short axles horizontally upon pivots fixed in the fore transoms, instead of turning the axle-tree as in locking the ordinary construction of carriages.

EDITOR.

To PIERPOINT GREAVES, *of Chorley, in the county of Lancaster, gentleman, for his invention of a method or methods of making ornamental, or fancy cotton, yarns, and threads, applicable to the making, sewing, or embroidering of cotton, and other fabrics.*—[Sealed December 22d, 1831.]

THIS Patentee says, "my invention consists in making ornamental cotton, yarns, or threads of a great variety of new shades of colour or varied colours, by the use of cotton wool, dyed the seven primitive colours, and bleached or white cotton; from the admixture of which, in varied proportions, I produce new or varied shades of colour, and which, by a second admixture of such colours when so produced, will produce other shades of colour, which with the addition of a few other colours of dark or light shade, such as taste or experience may determine, and not to be produced by the previous admixture of the primitive colours so prepared, I am enabled to produce an infinite variety of shades of colour, and varied colours difficult, if at all to be obtained by any other method.

Having provided a quantity of cotton wool, dyed the seven primitive colours, and such other shades of colour as taste or experience may determine, and also a quantity in a bleached or white state; I take suitable proportions of two, three, or more colours, and when necessary a portion of white to either or any of those separate proportions of coloured wool; and with the aid of the usual means and machinery now used in the various processes of preparing cotton for the purposes of spinning into yarn or thread, I so intermix the aforesaid proportions of two, three, or more colours, so as to produce a *self colour*, or varied shades of colour, which when afterwards made into roving, and spun into yarn, or doubled into threads, will present a new or distinct colour, or shades of colour different from the original colour so made use of in producing them. Thus, blue and yellow will produce a fine and fast green, or various shades of green, according to the proportions in which they are so mixed. Blue and green of various shades produce various shades of green; blue and red, or pink of various shades, purple and lilack.

By this method of producing ornamented coloured yarns or thread, I am not only enabled to produce new and varied shades of self and varied colours, but also, a superior quality of yarn in those colours, and of a variety of quality and fineness of yarn, equal, if not superior, to cotton yarns now produced from the material in its raw or natural state; and also capable of immediate application to the purposes of manufacturing, sewing, or introducing direct from the spinning machinery, and without its being subject to any of the processes previously necessary for effecting the same results, and admitting of being applied in the production or manufacture of a new and finer texture, and a variety of patterns are capable of immediate use, without having to go through the bleaching processes, which always delays and too frequently tends to injure the colour and pattern of such manufacture.

Having described the nature of my invention, and the manner in which the same is to be performed, and the importance and utility of its application, I do hereby declare, that I do not claim any part of the apparatus or machinery used either in the admixture of the various colours as before described, or in the subsequent spinning of the yarn or threads; but I do claim the production of various colours, and shades of colours by the admixture of suitable portions of two, three, or more of the primitive colours, with white sometimes added, and such other dark and light shades of other colours, produced from the primitive colours, or that cannot be so produced as to produce those varieties of colours, and shades of colours as hereinbefore mentioned."—[*Inrolled in the Inrolment Office, June,* 1832.]

To JOHN JELLICORSE, *of Stansfeld Mill, in the county of York, for his having invented certain improvements in spinning machinery.*—[Sealed 28th January, 1832.]

THE Patentee commences his Specification by pointing out the advantages contemplated by his improvements, which are applicable to that kind of spinning machinery called the *throstle.*

" These advantages consist in the greater steadiness of the spindles when revolving, and in removing or obviating the necessity of any stationary guides or loops for the yarns or threads to pass through between the front rollers and the spindle. By this contrivance, that amount of breakage is much diminished, and a great reduction in the weight of the spindles is effected from the peculiar arrangement and construction, and by which the power required to drive a given number of spindles at the same speed is much reduced; or, which is the same thing, a given number of spindles on this improved construction may be driven at a much greater speed than the same number of spindles of the ordinary construction, without a greater expenditure of moving power to drive them. These advantages, together with some others which will be described hereafter, constitute the object of the invention."

Plate III, fig. 7, is a front view, and fig. 8, an end view of part of a throstle, in which a portion of the ordinary gearing for driving the drawing rollers of the machine is shown, together with some other parts, for the purpose of exhibiting the position in which the improvements are placed, which are equally applicable to machines already constructed as to those built for the express purpose.

A portion of the end framing of a throstle is shown at *a*, *a*; and *b*, is the front or delivering roller; *c*, the copping rail, on which the bobbins *e*, are supported and traversed up and down in the ordinary perpendicular direction during the process of filling them with yarns.

It will be observed in these figs. that there is no bolster rail or intermediate support for the spindle between the copping rail, and the point or step on which it revolves, but that, unlike throstles of the ordinary construction, there is a bearing or support for the spindle above the flyer, and that the driving warve, whirl, or pulley is placed between the flyer and the upper bearing or support; and it is the placing the driving pulley, whirl, or warve so near to the upper bearing or support, together with the placing that support near the extremity of the spindle, which enables the Patentee to run the spindles with much less vibration than those of the ordinary constrnction, and also to use a much stronger and heavier flyer, (and thereby obviate the expansion of the arms of the flyer when going at great speed,) without the danger of materially increasing the vibration of the spindle.

In fig. 9, the spindle and other parts connected with it are shown on a larger scale, the letters indicating the same parts, as in the former figs. In this view it will be more clearly seen that the part of the spindle which revolves in the upper support marked *f*, is rather larger than the part of the spindle marked *i*, immediately above the warve *g*, and on reference to the horizontal view of the part *f*, shown above the spindle, it will be seen that the circular opening in which the spindle revolves is rather wider than the opening marked *h*, so that when the spindle is placed as represented at fig. 9, it is firmly supported in a perpendicular position by the part *f*.

This arrangement is for the purpose of facilitating the doffing, or removing of the bobbins from the spindles when required, and is effected in the following manner :—As soon as the bobbin is filled, or required to be removed from the spindle, the operator stops the bobbin by taking hold of the spindle with one hand, and having slipped the band from off the warve *g*, raises the spindle perpendicularly until the warve comes in contact with the part *f*, at which time the thinner part of the spindle marked *i*, being small enough to pass through the opening *h*, the operator is enabled to incline the spindle, and to disengage or doff the the bobbin, which he replaces with another bobbin that is nearly empty, having a few turns left on it by the reeler for the purpose of piecing up. The spindle being again replaced, as seen in fig. 9, the band is then put in its former position on the warve *g*, and the ends of the yarn having been pieced or joined together, the spinning process proceeds.

It will be observed that this arrangement for doffing is best executed when the copping rail is at or near the bottom of its traverse, as it would otherwise interfere with the removal of the lower point of the spindle from the step or support in which it revolves.

By reference to figs. 7, and 8, it will be seen by the direction of the yarn from the front roller to the bobbin, that it passes through the upper part of the spindle, which is constructed hollow for that purpose, and coming out below the warve, is carried round the arm of the flyer in the ordinary manner, and thence to the bobbin. This construction of the spindle and flyer being so different from the ordinary construction in throstles, the Patentee states that he has found the operation of piecing performed most conveniently by applying the mouth to the top of the spindle, and making or drawing air into the lungs at the same time that the end of the yarn from the bobbin is held to the small hole beneath the warve; by this action the end of the yarn immediately comes into the mouth, and the pieceing is easily effected.

In running the spindles at a speed above five thousand revolutions per minute, the drag which has been found to answer best has been a continuous piece of leather, as shown at *k*, *k*, in fig. 9, placed along the copping rail, with holes in it to permit the spindle to pass through, which prevents the leather from moving, and the bottom of each bobbin covered with woollen cloth glued or fixed to the bottom in a permanent manner.

The Specification concludes with these words:—"Having described the nature and construction of my improvements in spinning machinery as applied to the machine called the throstle, I do not claim any of the well known movements or parts of that machine which have been drawn for the purpose of showing the position in which my improvements are applied, but I do claim as applied to the throstle and other spinning and doubling machines, to which it is applicable, my invention of the peculiar construction and arrangement of the spindles and parts connected therewith, particularly the position of the warve on a throstle spindle supported at its two extremities, in a perpendicular position, along with the arrangement already described for effecting the doffing."—[*Inrolled in the Inrolment Office, July,* 1832.]

To THOMAS DE LA RUE, *of Crown Street, Finsbury Square, in the county of Middlesex, card maker, for his having invented certain improvements in making, or manufacturing, and ornamenting playing cards.*—[Sealed 23d February, 1832.]

THESE improvements are proposed under three heads:—first, printing the pips, and also the picture or court cards in oil colours by means of types or blocks;--secondly, effecting the same in oil colours by means of lithography; —and thirdly, gilding or silvering borders and other parts of the characters by the printing process, either by types, blocks, or lithography.

It is stated, that in the ordinary mode of manufacturing playing cards, their devices are partly produced by copperplate printing, and they are filled up with water colours by the means, called stencilling.

The Patentee does not propose any material alteration in the devices or forms upon the cards, but only to produce them with oil colours, and to effect this, he follows precisely the same mode as that practised by calico printers.

A set of blocks or types properly devised, are produced for printing the different pips of hearts, diamonds, spades, and clubs, or they are drawn, as other subjects, in the usual way upon stone. The ink or colour, whether black or red, is to be prepared from the best French lamp black, or the best Chinese vermillion ground in oil, and laid on the types and blocks, or on the stone, in the same way as printer's ink, and the impressions taken on to thick drawing paper by means of a suitable press in the ordinary manner of printing.

The picture or court cards are to be produced by a series of impressions in different colours, fitting into each other exactly in the same way as in printing paper hangings, or silks and calicoes, observing that all the colours are to be prepared with oil.

For this purpose a series of blocks or types are to be provided for each subject, and which when put together, will form the whole device. These blocks are to be used separately, that is, all the yellow parts of the picture for instance, are to be printed at one impression, then all the red parts, next all the flesh colour, then the blue portions, and so on, finishing with the black outlines which complete the picture.

If the same is to be done by lithography, there must be as many stones, as there are to be colours, each to print its portion only; and the impression or part of the picture given by one stone must be exactly fitted into by the impression given from the next stone, and so on until the whole subject is complete.

A superior kind of card is proposed to be made, with gold or silver devices in parts of the pictures, or gold or silver borders round the pips. This is to be effected by printing the lines which are to appear as gold or silver, with gilder's size, in place of ink or colour; and immediately after the impression has been given, the face of the card is to be powdered over with gold dust, silver, or bronze, by means of a soft cotton or wool dabber, by which the gold, silver, or bronze will be made to adhere to the picture, and the superflous portions of the metal will wipe off by a very slight rubbing. When the prints are perfectly dry, the face of the card may be polished by means of a soft brush.

If it should be desirable to make these improved cards to resemble ivory, that may be done by preparing the face of the paper in the first instance with a composition of size and fine French white, and a drying oil, mixed together to about the consistence of cream; this is to be washed over the paper, and dried before printing, and when the cards are finished, they will exactly resemble ivory.

The only thing remaining to be described, is the means by which the successive impressions of the types, blocks, or stones forming the parts of the pictures, are to be brought exactly to join each other, so as to form a perfect whole design when complete; this is by printers called registering, and is to be effected much in the usual way, by points in the tympan of the press, or by marks upon the stones.

The parts of the subject having been all accurately cut or drawn to fit, small holes are to be made with a fine awl through a quire or more of the paper at once, by placing upon the paper a guage plate, having marks or guide holes, and by observing these, the same sheet laid on several times, and always made to correspond with the points or marks, the several parts of the picture must inevitably register, and produce a perfect subject.—[*Inrolled in the Inrolment Office, August,* 1832.]

To RICHARD WILLIAMS, *of College Wharf, Belvidere Road, Lambeth, Surrey, engineer, for his invention of certain improvements in steam engines.*—[Sealed 28th February, 1831.]

THE whole subject of this invention is explained by the Patentee, in his Specification, in about two lines of writing. His object he says, is to render more regular the action of an engine worked by expansive steam, and with this view, he employs a loaded fly wheel which shall revolve with twice the speed of the working piston, so that it may assist the piston, both in its ascending and descending stroke.

No drawings are appended of any plan for effecting this object, nor is there another word of explanation given.—[*Inrolled in the Inrolment Office, August,* 1831.]

To Richard Trevithic, *of Aith, in the county of Cornwall, engineer, for his invention of an improved steam engine.* [Sealed 21st February, 1831.]

The objects proposed under this Patent are, first, constructing the boiler or steam generator within the condensor, for the purpose of affording greater security from the effects of accidental explosion; and at the same time giving to the condensor a more extended surface. Secondly, enclosing the condensor in an air or water vessel surrounding the boiler in order to increase the security, and which renders the apparatus, as the Patentee expresses it, "a perfectly safe high pressure engine." Thirdly, causing a current of cold air, or cold water, to act continually against the surfaces of the condensor, which will greatly promote the condensation of the eduction steam. Fourthly, returning the condensed water into the boiler, and thereby feeding it with pure water, which will prevent deposition and the accruing of fur within the boiler. Fifthly, the employment of the current of air used for cooling the condensor as a blast for urging the fire of the furnace.

These principles of novelty as adapted to high pressure steam engines, appear to be claimed in their largest latitude, and do not seem to be confined to any particular forms of construction, for the Patentee has not accompanied his Specification with drawings explanatory of his mode of applying his suggested invention, but merely describes the improvements as inclosed within a cylindrical vessel in the following way:—

The furnace is to be formed as the frustrum of a cone, the base supporting the fire bars, and the upper part forming the flue. Surrounding this is a cylindrical vessel to contain water, the inner surface of the vessel being the conical flue, and the outer or cylindrical part of the vessel is to be surrounded with a stratum of pulverised charcoal or some other imperfect conductor of heat. Beyond this there is to be a cylindrical space all round, of about an inch or two, formed by the inner surface of a cylindrical vessel containing water, which is the condensor, and without this, at the distance of an inch or two, is a cylindrical jacket inclosing the whole.

The cylindrical space thus formed between the jacket and the condensor is designed for the passage of a current of cold air, to be forced in by means of a blowing apparatus contiguously placed, and from which a tube leads to conduct the air. By this contrivance the outer surface of the condensor will be cool, and the current of air passing by apertures through the condensor will then act upon the inner surface of the condensor and cool it also, from thence the current of air will proceed under the boiler into the furnace, and promote the rapid combustion of the fuel.

Passages and valves must be provided for conducting the steam from the boiler to the working cylinder of the engine, and also from the eduction valves of the cylinder to the condensor; suitable pumps must also be provided for forcing the water from the condensor into the boiler in order to feed it. But the particular forms and arrangements of the parts, will depend upon the dimensions of the engine and other circumstances, such as the purpose to which it is to be applied. [*Inrolled in the Inrolment Office, August,* 1831.]

To William Augustus Archbold, *of Vere-street, Cavendish-square, in the county of Middlesex, gentleman, for his invention of an improvement in the preparing or making of certain sugars.*—[Sealed 19th October, 1830.]

The Patentee commences his Specification by saying, that he employs the same process as that for which he understands a Patent has been granted to *Marmaduke Robinson, of Great George Street, Westminster, in the county of Middlesex, dated 5th August,* 1830, *for "certain improvements in the process of making and purifying sugars,"* for the Specification of which Patent see the 8th Vol. of our London Journal of Arts, Second Series, page 258. The object, however, of the present Patent is to carry the process farther than was contemplated by the former, in as much as the improved preparation or mode of making sugar from cane juice, was intended only to produce that kind of brown sugar called Muscovado, but in the present instance it is proposed not only to refine it, but also to bring the sugar directly into the form of a lump or loaf of white sugar.

Without going over the description of the process, which is almost a verbatim copy of that above alluded to, it is only necessary to say in general terms that the first object is to deprive the sugar of any acid it may contain by mixing with the cane juice milk of lime, until, by the employment of chemical tests, it is found to be in a neutral state. Then the heating process is to be applied by steam pipes coiled round the interior of a wooden vessel filled with the neutrallized juice, and having brought the liquor nearly to the boiling point, it is then allowed to cool for the purpose of precipitating all the heavy dross to the bottom, and raising the scum to the top.

The purified liquor is now drawn off from the vessel, and is filtered through bags containing animal charcoal; or charcoal and bullock's blood, may be introduced into the liquor before it is filtered, for the purpose of assisting its purification.

The boiling process follows, by which the juice becomes crystallized, and in its semi-fluid state is poured into moulds where it cools, and condenses into solid lumps or loaves of refined sugar.

By these means the ordinary process of making loaf sugar is considerably shortened, as it is common to bring the sugar into a dry granulated form, and then to melt it into syrup and clarify it before it is poured into the moulds, but here it is taken from the boiler and cast into loaves or lumps without any intermediate operation. [*Inrolled in the Inrolment Office, April,* 1831.]

To Sir Charles Webb Dance, *of Hartesbourne Manor Place, in the parish of Bushey, in the county of Herts, knight, lieutenant colonel, for his invention of certain improvements in packing and transporting goods.*—[Sealed 5th August, 1830.]

The object of the Patentee is to prevent the inconvenience of unpacking and packing goods of various kinds which have to be transported to a distance, perhaps first by a waggon, then by a rail-road carriage, and, lastly by shipping.

It is proposed to construct suitable frames of moderate dimensions, having a platform as a bottom and sides, in which the goods are to be packed. The under side of the platform is to have an axle-tree or two axle-trees, to which wheels may be attached for transporting the package upon ordinary roads.

These platforms or frames for the passage of goods should be constructed, both in shape and dimensions, to suit the carriages in which they are to be placed for travelling on rail-ways, and in that case the wheels are to be removed, and the axle-tree turned round out of the way under the platform, they being attached to the frame by joints, for the purpose of being shifted, and are held fast, when in use by springs and catches.

When put on ship board, the frames are proposed to be turned bottom upwards for the convenience of packing, and small arms may be made to the sides of the platform, by which the load can be readily raised and lowered by chains or ropes attached to ordinary cranes.

These are all the points mentioned in the Specification, and no drawings are given of any particular form, or construction of frame.—[*Inrolled in the Inrolment Office, February,* 1831.]

To BENJAMIN COWLE TYZACH, THOMAS STORER DOBINSON, *and* JOHN ROBINSON, *all of North Shields, in the county of Northumberland, for their invention of certain improvements in windlasses, or machinery for winding up the cable, which they denominate Tyzach, Dobinson, and Company's compound lever windlass.*—[Sealed 4th August, 1832.]

IN the ordinary construction of windlasses the power of the men is exerted by means of levers or hand spikes, in forcing round the barrel upon which the cable is wound; in the present improved plan the power is to be applied to a ratchet wheel, near the end of the barrel, which is to be forced round by a series of pauls inclosed in a box, the box having a lever movement given to it.

Plate III, fig. 10, is a perspective view of a ship's windlass, with the improvements at one end, the same is to be applied at both ends of the barrel if required, that is both at the starboard and larboard side; and that would be found to be the most complete way of fitting the windlass, though it would act very well, if only fitted to one end or side of the windlass.

The block or ordinary paul bit carrying the paul is shewn at *a*; the ordinary toothed or ratchet wheel at *b*; and the barrel of the windlass at *c, c*, the axis of which turns as usual in the bit heads *d, d*; such is the description of an ordinary windlass. There is however, another toothed ratchet wheel fastened at the end of the barrel of the windlass, where the apparatus commonly called garrick wheels are sometimes placed. This is hidden in the fig. by a box *e*, attached, and enclosing the ratchet wheel and a series of palls.

Fig. 11, represents the creeper or box, with one side, which may be called the cover, removed, to show the position and action of the pauls which are within it, upon the ratchet-wheel.

It will be observed, that on the side of this ratchet-wheel a smaller circle is formed below the teeth, and on this circle or boss the sides of the paul-box or creeper, which are screwed together to form the box, fit and turn easily; so that, when the end of the paul-box or creeper is depressed, the pauls drop down into other teeth in the ratchet-wheel, and remains stationary with the windlass-barrel.

If, after the end, *f*, of the box or creeper, *e*, has been depressed, it be again raised, the pauls in the box will act against the teeth of the ratchet-wheel, and force it and the barrel of the windlass to which it is affixed, round in the direction of the arrow. The mode of raising and depressing the end, *f*, of this paul-box or creeper is by means of a lever or crank, *g*, and rod, *h*, shown in fig. 10.

There is a bar or axis, *i*, *i*, called the main or warping-shaft, passing along parallel to the windlass-barrel, taking its central bearing in the block or paul-bit, and at each end turning on a bearing in the bit-heads, *d*, *d*. At each end of this bar, on the outside of the bit-heads, there is a double-armed socket, *k*, *k*, which sockets are intended to receive the ends of the levers' handles, *m*, *m*, *m*, *m*, shown in their places.

To the crank-arms or levers, *g*, the short rods, *h*, are attached, which are also connected to the ends of the creepers. The levers or handles, *m*, *m*, can be worked up and down by manual or other power, and by the operation of the paul and ratchet the windlass will be driven round with great force at every upstroke of the creeper or ratchet-box.

It is only necessary further to state that if it be desired to give a continuous motion to the windlass, it will merely be required to place the warping shaft at an angle with the windlass barrel, and to let the short arms or cranks *g*, project from opposite sides of the warping shaft, there being a creeper or paul box at each end.

The Specification concludes by saying, "now whereas we claim as our invention the creeper here shown moving on and round the side bosses of the ratchet wheel, and forcing round the windlass barrell by means of the pauls within it connected with the compound lever, for the purpose of giving increased power to its action, whether the said creeper be applied to the ends of the windlass barrel as here shown, or to the centre or any other part that may be found more convenient.—[*Inrolled in the Inrolment Office, October*, 1832.

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NOVEL INVENTIONS.

A Patent has just been obtained by Mr. Affleck, of Dumfries, for a method of removing bars and sand banks, or other accumulations of soil from the mouths of harbours and rivers. The means are simple, and we understand they have been found to be efficacious, having been for some time past in operation on the southern coast of Scotland.

A temporary wear is formed partly accross the river or at the mouth of the harbour by means of movable parts of the apparatus which contracts, or in some degree concentrates the running water.

This concentrated current is by means of the wear directed to any part of the sand bank or bar intended to be operated upon; and over that part, a machine having a number of rotary peckers mounted upon a platform is placed for the purpose of breaking up the ground or disturbing the sand. The current is then let out, and the peckers set to work, when the force of the water carries out to a very considerable distance the materials, and leaves a clear water way of sufficient depth for the passage of vessels over the bar or sand bank.

From the state in which the bed of the river Thames was found to be near the site of the old London bridge, it is evident that a rapid flow of water will, if confined, exert great power in disturbing the ground near the current.

The Patentee proposes to take advantage of high tides and freshes or flood from the land; and states, that any current which flows with a rapidity of three miles per hour, will be sufficient to effect the work, though less forcibly and requiring longer time than if the current was more rapid.

We understand that in the river of Dumfries, the experiments, which were continued for some months, were found to be perfectly satisfactory. Some works on a large scale are now going on near Preston, in Lancashire, under the superintendance of Mr. Affleck, which will shortly prove beyond all doubt the extent of capability of the plan; and if fully successful, as we have every reason to expect, it will be one of the most important and exclusively useful inventions that has been brought to light for many years.

An American invention for the construction of railroads and bridges has very lately been made the subject of a patent, granted to James M'Donald, Esq., as a communication from a foreigner. It consists in a peculiar mode of combining bars of iron in a kind of chain, so as to support and brace each other.

These are to be erected on pedestals or piers at about fifty feet apart, which will support the entire weight and resistance of the structure perpendicularly, and the peculiar arrangement of the bars and bracings take away all lateral pressure. The upper edges of these bars are to constitute the rails for locomotive engines and team carriages, and when applied to the formation of ordinary roads, platforms of wood, metal, or stone, may be fixed upon the bars and covered with gravel.

It is said, that the construction of roads by these means will be considerably less expensive than the forming of new lines of road, where banks have to be raised and excavations made to obtain any thing like a level surface, as the points of bearing will be comparatively few in a long line, and the road be raised completely above all crossways and other obstructions, and will have a very elegant appearance when viewed from the surrounding country.

We have seen models of these bridges upon tolerably large scales made in iron, and have much pleasure in expressing our opinion, not only of their practicability, but that, in many situations very great advantages and economy would result from their adoption. In the construction of the proposed line of rail-way from London to Greenwich, it appears to us the plan would be peculiarly eligible, as the road might, at a comparatively small cost, be carried upon a level completely over many difficult places, and avoid many obstructions, which by any other plan it will be extremely expensive to surmount.

AMERICAN PATENTS.

For an improvement in the *Carpenter's Plane;* Phinehas Meigs, Madison, New Haven county, Connecticut.

The objects to be attained by this invention are to cause a single iron to have the effect of a double iron; and to secure or detach it with greater facility than in the ordinary mode of fastening. The plane is, in fact, a double iron plane of a peculiar and undoubtedly new construction. The opening, forming the mouth of the plane, is mortised through in the usual manner, excepting at the ends, which are perfectly flat, as no wedge is to be used. A plate of iron is let in on each end of the mortise, extending from the top to the face of the plane, and secured in its place by grooves, into which its edges fall, and by a screw passing into the stock. A flat plate of iron, similar to the cap of the double iron, has a pin projecting from each side of it, at about three-fourths of an inch from its lower end; these pins pass into grooves prepared for the purpose on the side plates, and a joint is thus formed upon which this cap iron moves; the pins rest upon the bottoms or lower edges of the grooves, which keep the iron at a proper distance from the face of the plane. Near the upper end of this cap piece, there is a thumb screw, which serves instead of a wedge to fasten the cutting iron. The cutting iron is dropped into its place, between the cap iron and the stock; when there, the thumb screw is turned, and its point bearing on the cutting iron, throws the lower edge of the cap against that of the cutting iron, and fixes it in its place; the whole bearing being against the pins in the groove.

The claim is to the peculiarities described.

"Every other part of the press described above, except what I have thus claimed as my own invention, is not mine; but I declare the same to be old, and known before this my application."

For an Improvement in the *manufacture of Potash;* Thomas H. Sherman, Hastings, Oswego county, New York.

We have in this Specification the announcement of some magnificant chemical discoveries; one of them is that salt will burn up, and that lime will become potash. Lest those who are adepts should be inclined to doubt, we will give the discovery in the words of the philosopher to whom it is due.

"The compound used is salt, lime, and lamp oil. First, when beginning to melt after the salt has done rising, it can then be ascertained what quantity of potash you are going to have. Suppose one barrel; first take half a bushel of salt, sprinkle half of it over the top of the potash. Secondly, take two bushels of slaked lime, add that in the same manner, then the remainder of the salt; and when the lime has disappeared, then add half a pint of lamp oil. This is the quantity used for one barrel, but it may be varied as the nature of the case may require. First, the use of the salt is to create a heat, and to purify the potash as it is supposed to burn up and add nothing to the quantity, but to the quality. Secondly, the lime is supposed to melt and become the first rate potash. Thirdly, the oil is to create a blaze to consume. Fifth, these are the contemplated uses of the above ingredients as used by me.

THOMAS H. SHERMAN."

If a Patent had been required for deterioration of one of the staples of our country, the one under consideration would most completely have fulfilled the intention; and it is earnestly hoped that its validity may in some way be tested in our courts of law, where we apprehend, it would not be esteemed to be a "useful invention," according to the intention of the patent law; as its inevitable result if acted upon, must be to injure the reputation of American potash in foreign countries ; the material would be entirely shoilt as regards its use in many manufactures.

For machinery for *making Bats for Hat Bodies ;* Stephen Hurlbut, Glastenbury, Hartford county, Connecticut.

The wool is to be received from a common carding machine upon an endless apron, which apron receives a vibratory motion, that it may cross the wool as it delivers it upon the former. " The former is a light wheel or table, having a horizontal rotary motion ; and on the former is a roller ; the roller is attached, by a swivel in its centre, to the apron on the former, and its outer or extreme end is secured to the frame of the carding machine, by means of a swivel and wire."

" The operation of the machine is as follows : — The web is received from the doffer of a common carding machine upon the apron. It is carried by the apron to the the former, and by the vibratory motion of the apron the web is crossed, as it is received between the former and the roller. The variation in thickness of the bat, for the formation of the body, must be regulated by the feed of the carding machine. The size of the bat for the formation of the body is regulated by a limb from the standard of the apron to which there is a crank pulley. When the bat is completed, it is torn from the circumference to the centre, gradually rolled over, and following the former through one of its revolutions, is taken off without stopping the machinery. The bat is then divided into three equal parts, which forms three hat bodies."

" My claim to the Patent is to the whole of the foregoing description attached to the carding machine, and for crossing the webbing and making the bat."

The drawing which accompanies this specification is a vey imperfect one; and is not indeed worthy the name of a drawing, although it serves to give some general idea of the plan. The claim as it stands would seem to include the revolving apron; in this case it appears to be too broad.

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Scotch Patents.

LIST OF PATENTS GRANTED IN SCOTLAND.

1831—1832.

(*Continued from Vol. I. page* 44.)

To Malcolm Muir, of Hutchinson Town, Glasgow, in Scotland, engineer, for an invention of "certain improvements in machinery or apparatus for preparing boards for floors and other purposes."—Dec. 22.

To Arthur Howe Holdsmith, of Dartmouth, in the County of Devon, Esq. for an invention of improvements in the construction of rudders, and in the application of the same to certain descriptions of ships or vessels.—Dec. 23.

To Abraham Adolphus Moser, of Canterbury Row, Kensington Road, in the county of Surrey, engineer, for an invention in consequence of a communication made to him by a certain foreigner residing abroad, of "improvements in certain description of fire arms."—Dec. 23.

To John Christophers, of New Broad-street, in the city of London, merchant, for an invention of an improvement in clothes buttons.—Dec. 23.

1832.

To William Hale, of Colchester, in the county of Essex, machinist, for an invention of a machine, or method for raising and forcing water for propelling vessels.—Jan. 26.

To Pierrepoint Greaves, of Chorley, in the county of Lancaster, gentleman, for an invention of a method or methods of making ornamental cotton yarns and threads applicable to the making, sewing, and embroidering of cotton and other fabrics.—Feb. 10.

To Samuel Hall, of Basford, in the county of Nottingham, cotton-manufacturer, for an invention of an improved piston and valve for steam gas and other engines, also an improved method of lubricating the pistons, piston rods, and valves or cocks of such engines and of condensing the steam and supplying water to the boiler of such engines as are wrought by a vacuum produced by condensation.—Feb. 17.

To Moses Teague, of Parkend Iron-works, near Colford, in the county of Gloucester, iron master, for an invention of certain improvements in making and smelting of pig-iron.—Feb. 20.

To William Sneath of Ison Green, in the county of Nottingham, lace-maker, for an invention of certain improvements in machinery for the manufacture of bobbin net lace.—Feb. 20.

To Alexander Beattie Shankland, of Liverpool-street, in the city of London, in consequence of a communication made to him by a foreigner residing in America, of an invention of a new method of cutting, working, and planing of wood, minerals, and metals, by means of machinery.—Feb. 24.

To Joel Benedict Nott, of Liverpool, Esq. in consequence of a communication made to him by a certain foreigner residing abroad, and invention by himself, for certain improvements in the construction of a furnace or furnaces for generating heat, and in the apparatus for the application of heat to various useful purposes being farther improvements upon a patent obtained by him dated the 4th day of November, 1830.—March 15.

To John Ericson, of Liverpool, in the county palatine of Lancaster, civil engineer, for an invention of an improved engine for communicating power to mechanical purposes.—March 15.

To James Thomson, of Gorbals, city of Glasgow, and county of Lanark, distiller, for an invention of an improvement on the construction of distilling apparatus, and particularly of the condenser or worm.—March 21.

To Peter Young, of Fenchurch-street, rope and sail maker, in consequence of a communication made to him by a certain foreigner residing abroad, for a new mode of manufacturing mangel wurzel, for the purpose of producing various known articles of commerce.—March 28.

To Elijah Galloway, of Carter-street, Walworth, in the county of Surrey, engineer, for an invention of certain improvements on paddle-wheels.—March 28.

To Warren Henry, of Loughborough, in the county of Leicester, hosier, Charles Hood, of the same place, frame-smith and setter up, and Benjamin Abbot, also of the same place, frame work knitter, for an invention of certain improvements upon the machinery now in use for making or manufacturing stockings, stocking-web or frame work, knitting-warp, web-warp, net and point net.—March 28.

To James Philip, damask-manufacturer, Dumfermline, for an invention of " an improvement in the manufacture of diaper and damask table linens."—April 3.

To Alexander Beattie Shankland, London, for an invention communicated to him by a foreigner, of " a new method of spinning flax and hemp by means of machinery."—April 4.

To George Lowe, of Brick-lane, in the county of Middlesex, civil engineer, for an invention of an improvement or improvements in and connected with the manufacture of gas for illumination.—April 6.

To Alexander Brown, of Liverpool, merchant, and Herman Hendricks, of Passy, near Paris, for an invention of an improved method or methods of manufacturing the prussiates of potash and soda, and the prussiates of iron, also for the construction of certain apparatus, vessels, or machinery to be used in the said manufacture, and a new or improved method or methods of employing the said prussiate of iron (or other prussiates of iron) as a substitute for indigo in dying all sorts of wools, and whether in the fleece, skin, spun or woven into cloth, stuffs, or otherwise, also in dying silks, cottons, linens, and in fact all other sorts and descriptions of textile or other substances fit for the purpose of receiving colours of a blue, blue-black, black, green, bronze, or any other colours, for which indigo has hitherto been used either as a ground work or auxiliary, and also for an improved arrangement of certain utensils and machinery to be used in the said dying processes. —April 17.

To John Samuel Dawes, of Bromford, in the parish of West Bromwich, in the county of Stafford, iron master, for an invention of certain improvements in the manufacture of iron.—April 17.

To John Potts, Richard Oliver, and William Wainwright Potts, all of New Mills, in the county of Derby, engravers to calico printers, and co-partners for an invention of an improved method or process of obtaining impressions from engravings in various colours, and applying the same to earthenware, porcelain, china, glass, and other similar substances.—April 30.

To Robert Montgomery, residing in the town of Johnston, in the county of Renfrew, in Scotland, for an invention of a machine for a new mode of spinning cotton, silk, flax, and other fibrous substances, communicated to him by a certain foreigner.—May 2.

To John Heathcoat, esquire, of Tiverton, in the county of Devon, for an invention of certain new or improved methods of draining and cultivating land, and new or improved machinery and apparatus applicable thereto, which machinery and apparatus may be applied to divers other useful purposes.—May 5.

To George Goodlet, residing in Leith, proprietor of the London, Leith, and Edinburgh Steam Mills, for an invention of a new method of preparing rough meal from ground wheat or other grains previous to their being dressed for flour, also rough meal from ground barley, malt, or other grain previous to their being put in the mash-tun for brewing or distilling.—May 14.

To Bennett Woodcroft, of Manchester, printer, for an invention of certain improvements in the construction of a revolving spiral paddle for propelling boats and other vessels on water.—May 21.

To Thomas Brunton, London, and Thomas Fuller, London, civil engineers, for an invention of an improvement or improvements in certain mechanical apparatus applicable to the raising of water or other fluids, and also a new or improved mode of effecting the same object.—May 22.

To William Drake, of Bedminster, near the city of Bristol, tanner, for an invention of an improvement or improvements in tanning hides and skins.—May 31.

To John Jellicorse, of Stansfeld Mill, in the county of York, spinner, for an invention of certain improvements in spinning machinery.—May 31.

To Joshua Bates, of London, gentleman, for an invention of certain improvements in machinery or apparatus for roving, twisting, or spinning cotton, silk, wool, hemp, flax, or other fibrous substances.—June 2.

To John Joyce, of John Street, London, for an invention of a certain improvement or certain improvements in machinery for making nails of iron, copper, and other metals.—June 8.

To Frederick Steiner, of Church, near Blackburn, in the county palatine of Lancaster, manufacturing chemist and Turkey red-dyer, for a certain process or processes by which spent madders, or madders that have been previously used, can be made to yield a great quantity of colouring matter, and for dyeing with the same of various colours all descriptions of cotton, linen, wool, silk, or any mixture of them, and also for improving, for dyeing, madders that have not been previously used.—June 22.

To Hugh Bolton, of Staples, in the parish of Bolton-le-Moors, in the county of Lancaster, carder, for an invention of an improvement in machinery used for carding cotton and other fibrous materials.—July 2.

To Alexander Beattie Shankland, London, esquire, for a new method of spinning wool.—July 21.

To John Holt the younger, of Whitby, rope-maker, for an invention of a mode or process for preparing and manufacturing certain fibrous materials.—July 28.

To John Howard Kyan, London, for an invention of a new mode of preserving certain vegetable substances from decay.—Aug. 1.

To William Daubeny Holmes, London, engineer, for an invention of a new method of heating houses and other buildings, and of applying heat to various manufactures, and other purposes.—Sept. 4.

To Pierre Nicolas Hainsselin, of Duke Street, St. James's, in the county of Middlesex, architect and engineer, for an invention of a machine or motive power for giving motion to machinery of different descriptions, to be called Hainsselin's Motive Power.—Sept. 18.

To George Jones, of Wolverhampton, in the county of Stafford, iron master, James Foster, of Stourbridge, in the county of Worcester, iron master, and John Barker and John Jones, both of Wolverhampton aforesaid, iron masters, for an invention of a certain improvement in the process now in use for producing or making malleable iron.—Sept. 21.

To Richard Whytock, of the city of Edinburgh, manufacturer, for an invention of an improved method or manufacture, which facilitates the production of regular figures or patterns on different fabrics, particularly velvets, velvet pile, and Brussels, Wilton, and Turkey carpets, with a saving of material.—Sept. 21.

To Baron Charles Wetterstedt, of the Commercial Road, in the county of Middlesex, for an invention of a composition or combination of materials, for sheathing, painting, or preserving ships' bottoms, and for other purposes.—October 5.

To John Hornby Maw, of Aldermanbury, in the city of London, surgical instrument maker, for an invention of an improved apparatus for injecting enemata.—October 23.

To Angier March Perkins, of Harper Street, in the county of Middlesex, civil engineer, for an invention of certain improvements in the apparatus or method of heating the air in buildings, heating and evaporating fluids, and heating metals.—Nov. 2.

To John Brown, of Heaton Norris, in the county of Lancaster, cotton manufacturer, and Thomas Heys, of Heaton Norris aforesaid, book keeper, for an invention of an improvement in the machinery used for spinning cotton, silk, flax, and other fibrous substances, commonly called throstles.—Nov. 2.

To John Nash, of Market Rasen, in the county of Lincoln, brick manufacturer, for an invention of certain improvements in the machinery and process used in the manufacture of bricks, tiles, bread biscuits, and various other articles of commerce made from plastic.—Nov. 7.

To George Lowe, of Brick Lane, Old Street, in the county of Middlesex, civil engineer, for an invention for increasing the illuminating power of such coal gas as is usually produced in gas works; also for converting the refuse products from the manufacture of coal gas into an article of commerce, not heretofore produced therefrom, and also for a new mode of conducting the process of condensation in the manufacture of gas for illumination.—Nov. 6.

New Patents

SEALED IN ENGLAND.

1833.

To William Gratrix, of Salford, in the county of Lancaster, silk dyer, for his invention of an improved method of imparting to various woven fabrics, or to the yarns or threads of which the same are intended to be composed, the colour necessary to form the required patterns thereon. —Sealed 5th January—6 months for inrolment.

To John Reynolds, of Oakwood, near Neath, in the county of Glamorgan, iron master, for his invention of an improved engine and apparatus, to be worked by steam and other motive power.—Sealed Jan. 9th—6 months for inrolment.

To William Thomas Shallcross, of Holt Town, within the parish of Manchester, in the county palatine of Lancaster, mechanic, for his invention of certain improvements in looms or machines for weaving cotton, linen, silk, woollen, and other fibrous cloths and substances.—Sealed Jan. 9th—6 months for inrolment.

To Samuel Hall, of Basford, in the county of Nottingham, cotton manufacturer, for his invention of an improved method of lubricating the pistons, piston rods, and valves or cocks of steam engines, and of condensing the steam of such engines as are worked by a vacuum produced by condensation; also a method of condensation applicable to other useful purposes.—Sealed Jan. 9th—6 months for inrolment.

To Joseph Gibbs, of the Kent Road, in the county of Surrey, engineer, for his invention of certain improvements in the processes of dressing or preparing hemp, flax, New Zealand flax, and other vegetable fibrous substances, to render them fit for spinning, paper making, and other pnrposes.—Sealed January 9th—6 months for inrolment.

To Thomas Moore Evans, of Birmingham, in the county of Warwick, merchant, for an invention communicated to him by a certain foreigner residing abroad, for improvements in machinery for preparing and dressing flax, hemp, and other fibrous materials.—Sealed January 10th—6 months for inrolment.

To Samuel Parker, of Argyle Street, Oxford Street, in the county of Middlesex, bronzest, for his invention of certain improvements in apparatus for making extracts from coffee and other substances.—Sealed Jan. 11th—6 months for inrolment.

To William Harrold, of Birmingham, in the county of Warwick, merchant, for an invention communicated to him by a foreigner residing abroad, of an improvement or improvements in machinery for making or manufacturing paper.—Sealed Jan. 11th—6 months for inrolment.

To Walter Hancock, of Stratford, in the county of Essex, engineer, for his invention of an improvement or improvements upon steam boilers.—Sealed Jan. 15th—6 months for inrolment.

METEOROLOGICAL JOURNAL,

FOR 1832-3.

1832.	Thermo.		Barometer.		Rain in inches.	1833.	Thermo.		Barometer.		Rain in inches.
	Hig.	Low	Hig.	Low			Hig.	Low	Hig.	Low.	
Dec.						Jan.					
26	45	29	30,07	30,02	,2	11	37	20	29,90	29,80	
27	41	29	30,09	30,01		12	37	23	29,82	29,78	
28	39	27	29,85	29,75		13	42	30	29,90	29,83	
29	41	29	29,70	29,66	,05	14	43	35	30,15	30,13	
30	37	28	30,05	Staty.	,375	15	41	30	30,13	30,10	
31	44	30	29,89	29,60	,025	16	43	33	30,13	30,12	
Jan. 1833.						17	42	33	30,10	30,07	
1	40	31	29,78	29,65	,075	18	37	31	30,09	30,02	
2	45	35	30,14	29,97	,025	19	37	31	30,20	30,19	
3	43	33	30,40	30,31	,25	20	39	33	30,22	30,20	
4	37	31	30,46	30,44		21	35	25	30,26	30,23	
5	37	29	30,40	30,37		22	35	21	30,36	30,28	
6	36	25	30,41	30,39		23	37	19	30,42	Staty.	
7	35	22	30,50	30,44		24	39	20	30,40	30,27	
8	36	29	30,55	30,51		25	35	22	30,26	30,10	
9	35	27	30,53	30,41							
10	31	22	30,30	30,05							

The height of the Barometer during the early part of January is worthy of particular remark, it having on the 8th attained a greater altitude than at any time within the last five years. On 28th December, 1827, it was 30,58.

On the evening of the 22d, about half past seven, a remarkably brilliant meteor was seen in the North, rather to the Eastward of Cygnus.

Edmonton.

CHARLES HENRY ADAMS.

Latitude 51° 37 32 N.
Longitude 3 51 West of Greenwich.

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ASTOR, LENOX AND
TILDEN FOUNDATIONS

Fig. 1.

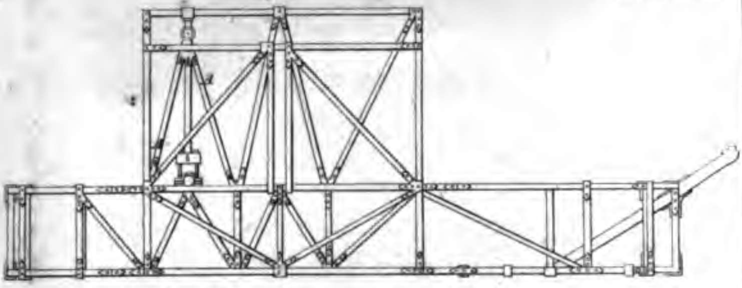


Fig. 2.

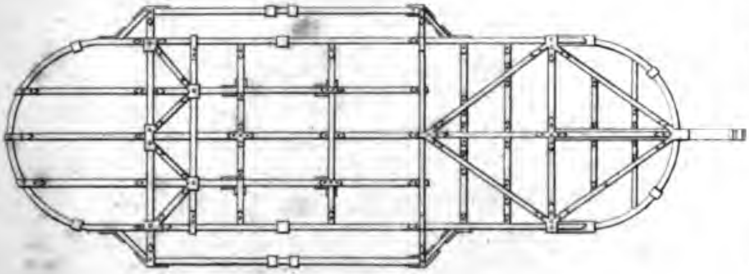


Fig. 10.

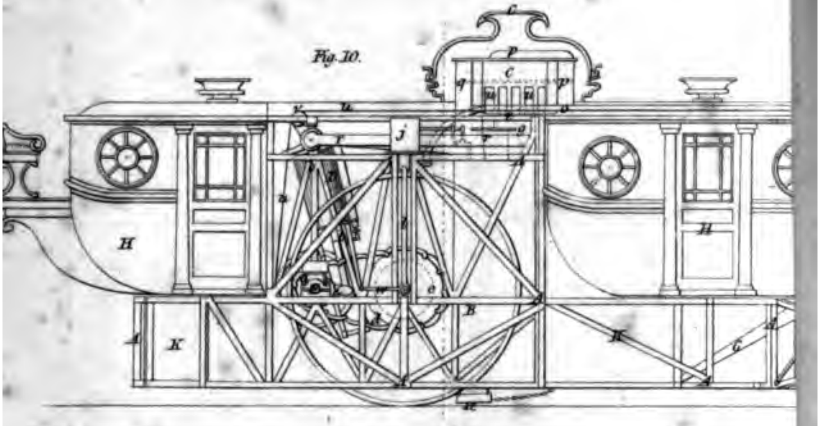
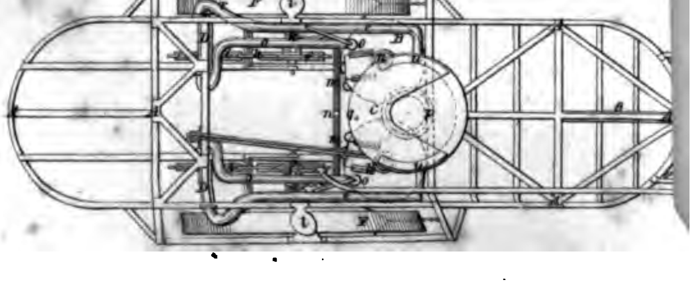


Fig. 11.



Newton del.

THE

London

OURNAL OF ARTS AND SCIENCES,

AND

REPERTORY

OF

PATENT INVENTIONS.

No. XI.

CONJOINED SERIES.

Recent Patents.

To WILLIAM CHURCH, *of Bordsley Green, near Birmingham, in the county of Warwick, Esq. for his having invented certain improvements in apparatus to be employed in the transportation of goods or passengers; parts of which said improvements are also applicable to the ordinary purposes of steam engines.*—[Sealed 9th February, 1832.]

THE objects proposed under this Patent we alluded to in our comments upon an article written upon steam carriages, in the First Vol. of our Conjoined Series, page 144. We then gave a general idea of the construction of Doctor

Church's new steam coach, and of the peculiar features which it embraced; the following Specification will exhibit its details:—

These improvements in apparatus to be employed in the transportation of goods and passengers, parts of which are also applicable to steam engines, apply particularly to the construction of locomotive carriages intended to convey passengers and goods on ordinary roads by the agency of steam, and are comprehended under the three following general heads:—

First, the construction of the framing of the carriage which is to support the bodies of the vehicle, and enclose the machinery by which it is impelled, and the manner of connecting the ribs or rails for the purpose of giving great strength from a comparatively small weight of material;—Second, the peculiar construction of the boilers and flues, by which a sufficient quantity of water may be converted into steam to work the engine;—Third, the construction of the running wheels of the carriage, designed particularly to prevent concussions, as they pass over inequalities on the surface of the road, which are made with elastic rims, that bend into oblate figures or flatted curves, as they come in contact with the ground, thereby preventing the wheels from sinking or sliding round.

In constructing the framing of the carriage for the purposes stated under the first head, I have endeavoured to form, arrange, and connect the timbers, ribs, rails, rods, tubes, or bars of the same, so as to constitute a skeleton framing, which shall be trussed, and supported in every part and way that is likely to be exposed to pressure, strain, or twist, occasioned by weight, unequal force, or vibration: in order that each timber, rib, rail, rod, tube, or bar of the framing may receive and sustain its due proportion of weight or strain, and thereby relieve and support the part on which the force immediately acts; or in other words, that the strain or force may be as equally diffused as possible over all parts of the skeleton frame. And further, I so construct the said skeleton framing, that I am enabled to enclose within it the boilers, engines, and machinery for propelling the carriage, and also to support by it the carriage bodies for the reception of passengers and luggage.

In arranging the parts of the skeleton framing, I form what may be called an engine room, or space for the reception of the engines, boilers, and machinery, about equal in height to that of the bodies of the intended vehicle. In the accompanying drawings (see Plate IV.) fig. 1, represents a side elevation of a complete skeleton framing for a carriage constructed upon the principles above set forth. Fig. 2, is a horizontal view of the same as seen on the top.

When the framing is constructed of wooden rails, as represented in the figures, I connect or unite them together by clips or clamps of iron or other metal, by which means, I avoid the necessity of morticing and tenoning the joints of timber, and retain the entire substance and strength of the wood without having injured the fibres.

The framing may be constructed by connecting rods, ribs, bars, or tubes of metal upon the principles here set out, the junctions being secured by socket joints, fastened by cotters, a specimen of which is shown at A, A, in fig. 1, which are there adopted for the convenience of more readily attaching and detaching the working cylinders and their appendages.

In describing the peculiar construction of the boiler, furnace, and flues, it is to be first observed, that the boiler consists of a combination of tubes filled with water, arranged in vertical positions side by side, in circular or polygonal ranges, so as to form or constitute a furnace, the fire being in the middle of the system or arrangement of tubes, and the flues are smaller tubes severally passing through the interior of the water tubes. The construction of these boilers will be seen by reference to the several figures descriptive thereof.

Fig. 3, is an external view in elevation of a system of tubes constituting a boiler and furnace, the double casings which form the chimney or outer flue, and the air or blast passage being removed, and partly shown in section.

Fig. 4, is a section of the same, taken vertically through the middle of the boiler and furnace, for the purpose of exposing the water tubes *a, a, a, a, a.*—It will be perceived that these water tubes are arranged in pairs of dissimilar length, and that each pair has a syphon tube *b, b,* passing through them.

Fig. 5, is a horizontal section, taken through the cylindrical steam chamber *c*, above the bends of the cyphons *b*, showing a top view of those syphons, by which their connexions with the several pairs of water tubes will be perceived.

The particular construction of the several water tubes of the boiler, and their connexion in pairs with the syphon flues, are shown at fig. 6, which represents one pair of the water tubes, and their connecting syphon detached from the boiler, and drawn in section upon an enlarged scale; *c, c,* represents a portion of the cylindrical steam chamber, the lower part of which is occupied with water, conveyed through a supply pipe *d*, the level of the water being raised to the height of a few inches above the bends of the syphon tubes *b, b,* as seen in fig. 4.

From this cylindrical chamber the water descends into the tubes *a, a, a, a, a,* and fills them completely; which tubes are secured to the bottom plate of the steam chamber by screwing or otherwise, as shown at *j*.

The flames and heated vapours from the fire, play freely around the external surfaces of those parts of the boiler, which are formed by the ranges of short tubes, and upon those parts of the surface of the range of long tubes which are presented towards the fire, but being confined by the close contiguity of the latter range, the flame and vapours thence proceed up the shorter legs of the syphon flues within the water tubes, and down the longer legs, as shown by the arrows, and having imparted their heat to the water through the metallic surfaces, pass into the dust box, at the bottoms of the longer legs of the syphon, and from thence proceeds up the outer flues *f*, to the chimney *g* : the dust having been arrested in its course by a fine wire gauze sieve or screen *h*, (see figs. 3 and 4,) which is placed as a partition at bottom between the dust box and the lower aperture of the outer flue *f*.

The ends of the syphon flues are secured to the lower extremities of the water tubes by screwed caps *i*, as shown in fig. 6, and in the section of the complete boiler at fig. 4, or they may be otherwise connected, so as to constitute the inner surfaces of the water vessels.

The flues are made in the forms of syphons or bent tubes, not having any attachment to the water tubes at top, which arrangement allows of the metals expanding and contracting under variations of temperature, without disturbing or straining the joints of the metal. The lower extremities of the water tubes may be inserted, by screwing or otherwise into the upper surfaces of annular chambers *k*, and the ends of the syphons into the lower surfaces of the same, as represented in the figures 3 and 4, and for the purpose of promoting a circulation of the water, small connecting tubes *l*, *l*, are in that case made to lead from one annular chamber to the other.

In order to maintain a constant supply of water at the lower parts of the boiler tubes *a*, small perpendicular conducting pipes are introduced within, as shown at *m*, *m*, fig. 6. Both ends of these pipes are open, but a small cap or shield *n*, *n*, is placed at a short distance beneath the lower aperture. The object of this shield is to prevent the globules of steam, as they form at the bottom of the boiler, from raising up the small pipes; the consequence of which is, that the steam will ascend freely up the water tube on the outside of the conducting pipes, and a constant current of the water will descend through these small conducting pipes *m*, and keep up a continual supply to the bottom of the boiler. One of these pipes and its cap is shown detached at fig. 7; and a horizontal section of the water tube and flue is shown at fig. 8, with six of the conducting pipes *m*, inserted within.

The effect of these internal conducting pipes will be clearly perceived in the diagram fig. 9, where the ascending arrows indicate the course of the steam, and the descending arrows that of the water.

In order to produce the greatest intensity of heat, and the most perfect combustion of the smoke, I supply or inject into the furnace two currents of air, the one on the top of the fuel, which passes downwards through an aperture in the steam chamber, the other at the bottom, proceeding upwards between the five bars *o*, *o*, meeting the former, whence they pass through the syphon flues *b*, and the outer flues *f*, to the chimney *g*. These currents of air may be obtained by any convenient mode of producing draft or blast, such as a rotary fan or blowing machine, which may be placed above the boilers, as represented in figs. 10 and 11.

Fig. 10, is a side view of the carriage, the framing and the working parts of the machinery being exposed to view. Fig. 11, is a horizontal or plan view of the same. In these figures are seen the two bodies B, B, and the blowing apparatus C, above, which stand toward the right hand, and the working cylinders D, D, to the left, with the mode of connecting the action of their pistons to the running wheels F, F.

The cylindrical case C, at top of the carriage contains two horizontal fan wheels upon one axis, the case being divided by a horizontal partition, shown by the dotted line in fig. 10. In the upper compartment the fan revolves for the purpose of injecting air into the furnace, taking its supply from the atmosphere through an aperture and channel *p*, and it forces the air into the casing of the boiler through an opposite channel *q*, seen also in figs. 3 and 4.

It is intended that the air so injected shall be taken from between the engine room and the carriage bodies, in order to keep the latter cool. One portion of the air so injected passes through the apertures *r*, *r*, of the case, and through the central passage of the steam chamber down into the furnace, producing the upper blast, and the other portion of air proceeds down the outer channel *s*, *s*, of the casing, (taking up the caloric from the contiguous flue as it passes,) and through the aperture *x*, below, between the fire bars into the furnace, and produces the under blast. The other fan wheel in the lower compartment of the cylindrical case, which is intended to act as an exhauster, brings the vapour from the chimney *g*, and discharges it through apertures *u*, *u*, into the dome, from whence it escapes to the atmosphere.

The fuel is supplied to the furnace through a cylindrical box or hopper *v*, above. A horizontal slider *w*, intersects the lower part of this hopper closing the mouth of the furnace, and forming a bottom to support the fuel, and a flap or cover at top shuts up the hopper close when the fire requires replenishing, which is done by withdrawing the slider *w*, when the fuel falls into the furnace.

Under some circumstances I find it convenient to embody the principles of the boiler above described (that is, the syphon flues passing through pairs of water tubes) in different forms and modes to those already shown; instead of constructing the outer range of water vessels of cylindrical tubes, as in the previous instance, I form them by two corrugated plates of metal, bolted or otherwise secured together, as shown in the sectional figure 12; *a, a, a,* are the water vessels that constitute the boiler, the sides of which are held together by the bolts *x, x, x;* the syphon flues *b,* are constructed and united to the water vessels by screws or otherwise, as before explained, and the steam vessels *c,* above, is formed by continuing the outside corrugated plates of the water vessels upwards to the required height, and adapting similar corrugated plates for the inside surface of the steam vessel by riveting or otherwise securing such plates to a flat plate, for forming the bottom of the steam chamber, and bracing the sides together by transverse bolts.

The peculiar construction of the running wheels will be seen by fig. 13, which represents the face of one of these wheels complete, and fig. 14, a section of the same, taken transversely. These wheels are of considerable breadth, and also of large diameter; they are formed by the union of several hoops *a, a,* of elastic wood, connected together and secured by clamps *b, b,* bound round the hoops, as shown in the two last mentioned figures, which constitute the felly or rim. The outer periphery of the wheel is bound by a hoop of iron *c, c, c,* forming a tire, and the spokes consist of elastic curved plates of steel or springs *d, d, d,* bending and moving upon joints. The outer ends of all the elastic spokes *d,* are attached to the felly by joints at the backs of the several clamps, and the reverse ends of these elastic spokes are connected by joints to a pair of metallic rings *l, l,* firmly fixed by radial and diagonal rods *f*, *f*, *f*, to the nave or metal box *g*, of the wheel in the centre.

These running wheels are fixed upon short rotary axles *h*, and the weight of the carriage bearing upon these axles, causes the peripheries of the wheels to bend into slightly oblate figures, or flatted curves, as they pass over the road. This deviation from the circular figure of the wheel, by its increased surface, causes the wheel to take firmer hold of the ground, and consequently to be less liable to slip round, or sink into the road.

The springs thus introduced into the wheels, it may be observed serve as substitutes for the springs usually employed in hanging carriage bodies; but in order to afford greater elasticity and ease of action to the carriage, I have recourse to the following means:—A cylindrical box *i*, containing air, and closed at top, is attached firmly to the frame work, as shown in figures 10 and 11. In this cylindrical box a piston *k*, shown by dots in the side view, fig. 15, is fixed on the top of a forked yoke *l*, *l*, which plays freely up and down, and is made tight by a leather cup at its upper part in the usual manner of packing hydraulic presses, and the lower ends of the yoke have eyes or bearings in which the short axles *h*, turn freely. By injecting a sufficient quantity of air into the vessel *i*, an air spring is produced, upon which the weight of the carriage and its burden bears, and through the medium of the pistons and the yokes that weight is supported by the running wheels.

As the axles of the wheels would be liable to lateral movement unless restrained, I make use of jointed rods *m*, *m*, and *p*, seen in the horizontal representation of the wheel and its appendages at fig. 15. These rods *m*, *m*, are connected at one end to the framework by hinge joints *n,n*, and at the reverse end by rings *o*, *o*, to the axles, (see the side elevation detached at fig. 16, and edge views fig. 17.) The rod *p*, it will be perceived is connected to the inside of the wheel axle by a ball and socket joint, shown in the section of the wheel and its axle at fig. 14, and therefore while it holds the axle firmly endwise will not impede its motion. By means of these rods the carriage will be allowed to vibrate in vertical directions.

For the purpose of preventing the escape of air past he piston in the box *i*, I inject a small quantity of oil, water, or other liquid, by means of a small force pump. This force pump may be occasionally employed to inject air, and consequently the elasticity of the spring may be accommodated to the weight of the burthen it may have to sustain.

Although I have described air boxes and pistons, I wish it to be understood that I do not intend to confine myself to air springs, as under some circumstances it might be found desirable to employ metallic springs.

The power exerted by the working cylinder and pistons of the engines, is communicated through the piston rods to the crank shaft *s*, in the usual way, and a pulley *t*, (see fig. 16,) fixed upon the crank shaft, drives the running wheels by means of the endless chain *u*, carried over a similar pulley *v*, on each of the running wheel axles, shown in operation in figs. 10 and 11. But as it is necessary to vary the propelling power, I have also introduced two chain pulleys *w*, and *x*, of dissimilar diameters upon the said crank shaft and wheel axle, with an endless chain passed over them, (see figs. 15, and 17.) Both the pulleys upon the wheel axles turn loosely, and either of them may be locked into gear by means of the sliding clutch boxes *y*, *y*, with the levers and rods *z*, *z*.

In describing the general construction of the carriage shown at figs. 10 and 11; A, A, is the skeleton or frame work of the carriage B, B; are the two boilers within their casings; D, D, are the engines, which are of a similar construction to that described in the Specification of a Patent granted to me by His present Majesty, dated the 29th day of November, 1830, (see Vol. VIII. of the London Journal of Arts, Second Series, Page 1,) but these engines are in the present instance reversed in their positions, hanging pendant from their induction and eduction steam pipes, and turning in the bearings at the upper end of standards *b*, *b*, *b*; E, is the crank shaft turning in bearings upon the frame work, which is kept in its proper place by the screw bolts *a*, *a*, on the end of the upright piece *b*.

The crank shaft gives motion through the chain pulley *c*, and endless chains *d*, to the chain pulleys or riggers *e*, mounted upon the axles of the running wheels F, F; upon their axles also are mounted the other chain pulleys *f*, *f*, connected by endless chains *h*, *h*, to the other pulleys *i*, *i*. Upon the crank shaft *k*, *k*, are the clutch boxes keyed to the axles of the running wheels, with their levers *l*, *l*, connected by the rods *m*, *m*, to the lever *n*, by which the clutch boxes may be slidden from one pulley to the other, so as to alter the speed of the running wheels, as described.

The cylinders *i*, *i*, contain the air springs, with the pistons on the tops of the forked rods *l*, *l*, and support the carriage; *n*, is the fuel feeder or hopper; *o*, is the safety valve and steam pipe leading to the engines; *r*, *r*, the pipe for conveying the eduction steam from the engines to the chimney *g*; C, is the hood or dome, containing the blast and exhausting fans or blowers, as before described. Upon the under side of the lower fan is fixed the pulley *t*, which communicates rotary motion to both of them from the endless band *u*, *u*, which is passed over pulley *v*, and the larger pulley *w*, upon the crank shaft E; H, H, are the bodies of the carriages for the conveyance of passengers; K, K, are spaces, which may be used for the depositing of luggage.

The reservoir for water to supply the boilers may be placed under the chain rigger on each side of the engine room, and those for fuel above them, so as to leave a clear open space for the engineer in the middle; or they may be placed in any other convenient part of the carriage; L, is the pilot wheel, under the control of the conductor stationed on the front seat of the carriage. This pilot wheel is mounted on a circular framing 1, 1, and turns in bearings in the ends of the elevated rods 2, strongly braced to the circular frame; the upper ends of these rods are bolted or connected together on the ends of the shaft 3. This shaft has a collar, with a strong metal spring contained in the box 4, resting upon it. This spring box is firmly fixed into the end of the stem or a poll 5, of the carriage; 6, is a toothed quadrant fixed upon the shaft 3, into which the pinion 7, having only two teethed gears; this pinion is attached to the vertical rod 8, having a horizontal winch handle 9; and when the conductor turns this handle round, the pinion will move the quadrant 6, and hence, through the shaft 3, the wheel L, also, and its circular frame, will move round within the outer circular rim 10, which is fixed to the carriage.

There is a speaking pipe 11, or tube, through which the conductor can communicate any directions to the engineer; 12, is an angular shaped piece of metal suspended to the under side of the frame work just before the running wheels, and nearly touching the ground, and is there placed for the purpose of removing any loose stones or other obstruction out of the track or way of the wheels, by which one cause of jolting or shaking will be avoided, and in case it comes in contact with any fixed obstruction, the chain will allow it to rise up.

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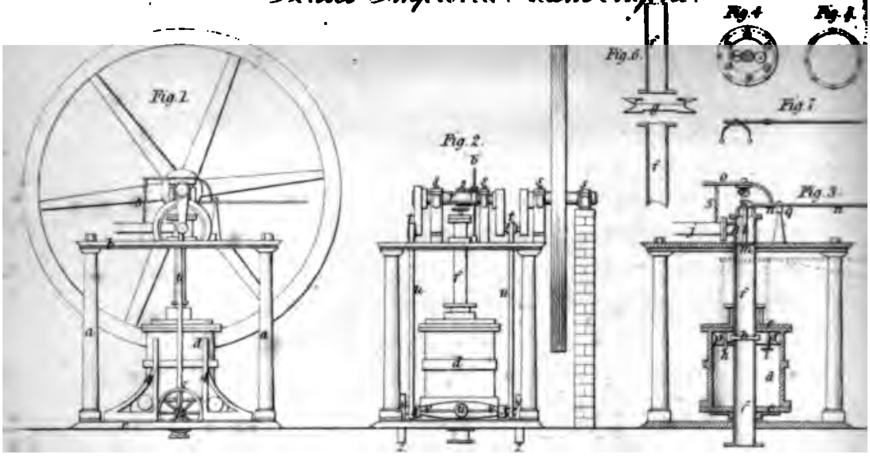
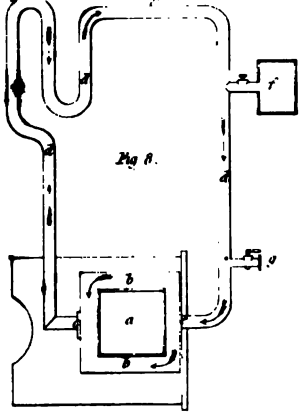
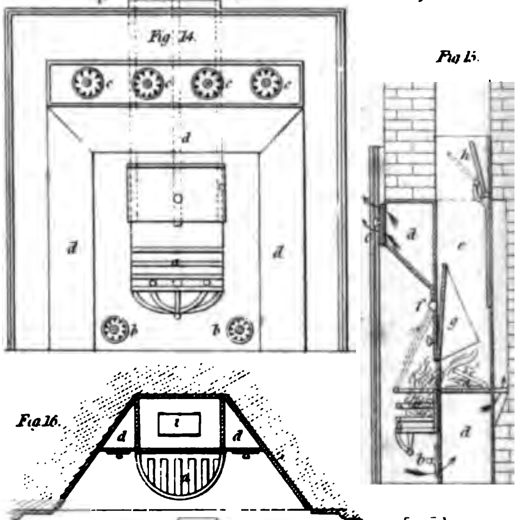
Beale's Improved Steam Engine.

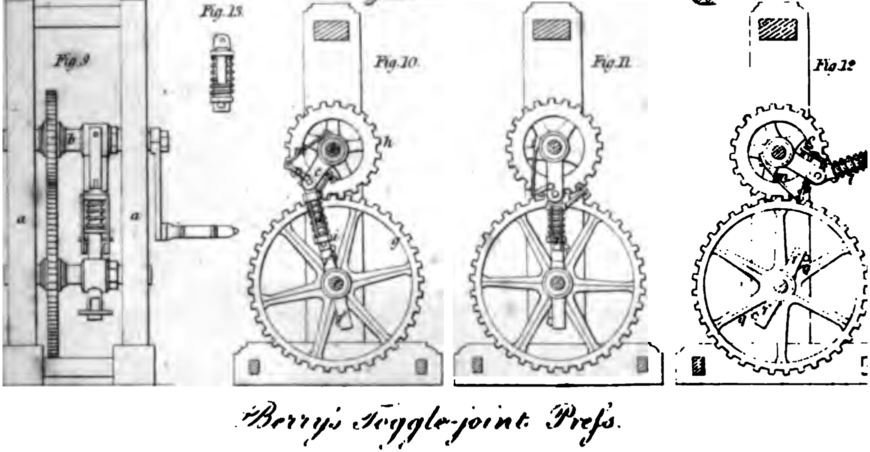


Holmes's Apparatus for heating houses



Pycroft's Improved Stove Grate.





Berry's Toggle-joint Press.

In order to prevent the destruction of the fire bars by the heat of the furnace, I make them of a trough-like form, the hollow of which bar I file with fire clay or black lead, or other material, which will resist the action of heat.—[*Inrolled in the Rolls Chapel Office, August,* 1832.]

Specification drawn by Messrs. Newton and Berry.

To Joshua Taylor Beale, *of Church Lane, Whitechapel, in the county of Middlesex, engineer, for certain improvements in steam engines.*—[Sealed 28th March, 1832.]

This is a peculiar construction of steam engine, in which the cylinder moves up and down upon a fixed piston. The following is the Patentee's description of the machine:—

"My invention consists of a peculiar combination or arrangement of certain parts of a steam engine, whereby the steam cylinder is caused to be actuated on a fixed hollow piston rod; the hollow piston rod serving as an induction, as well as an eduction way for the steam, as will be fully described hereafter.

Plate V. fig. 1, is a front elevation of an engine, constructed according to my invention. Fig. 2, a side elevation of the same; and fig. 3, is a section of fig. 1. Figs. 4, 5, and 6, show some of the parts separately, whereby their construction may be more readily understood. In each of these figures the same letters of reference are used to indicate similar parts wherever they occur.

Four pillars *a*, *a*, are screwed to the four corners of two rectangular framings *b*, and *c*, and thus is formed the framing on which the engine is mounted; *d*, is the steam cylinder; the covers *e*, *e*, having stuffing boxes, through which the piston rod *f*, passes. This piston rod is hollow, as will be seen in the section at fig. 3; and it will also be perceived, that the piston rod is fixed at top and bottom in framings *b*, and *c*. This hollow piston rod serves as an the induction, and also an eduction pipe for the steam to pass to and from the steam cylinder.

The piston *d*, is affixed to the piston rod *f*, (see fig. 3,) and this piston is similarly constructed to those in general use, except that there are valves *h*, and *i*, formed therein, which admit of the steam to flow to and from the steam cylinder, as will be fully described hereafter. The steam pipe *j*, leads from the boiler, and is connected to the hollow piston rod *f*, at *k*.

At the top of the piston rod there is a stuffing box formed, through which passes the rod *l*; this rod *l*, is affixed to the valve *m*, and by this rod the valve may be raised from its seat, either by the lever *n*, or the lever *o*; the lever *n*, having its fulcrum at *s*; and the lever *o*, is a bent lever, having one end turned at right angles, which is affixed under the lever *n*, at *p*, and thus causes the valve *m*, to rest on its seat when not acted upon by the wipers 2 and 3, affixed on the main shaft *r*, or by depressing the lever *n*, by hand.

The main shaft *r*, turns in four bearings *s*, and has two cranks *t*, which are acted upon by the connecting rods *u*, attached to the framing on which the steam cylinder *d*, is affixed.

This framing is called a cradle, and consists of a strong square frame *v*; the steam cylinder being affixed to the framing *v*, by axes or pivots w, one on each side of the cylinder, by which a slight motion may be obtained without derangement to the cylinder, and thus the cylinder will be free to move perpendicularly on the piston rod, even though any of the parts may be slightly inaccurate, which would not be the case were the framing incapable of allowing this slight motion.

On to the side frames *x*, *x*, of the framings or cradle *v*, *v*, are formed axes or pivots *y*, *y*, to which are affixed the connecting rods *u*, and also the friction wheels *z* *z*. These pivots or axes *y*, *y*, also allow of a slight motion without derangement of the steam cylinder, in an opposite direction to that already described, and are intended for the same purpose.

At the front and back of the steam cylinder *d*, there are placed two perpendicular guides 4, 4, between which the wheel *z*, *z*, work, as will be readily understood by examining the figs. 1 and 2.

Fig. 4, shows a separate view of the piston *g*, and fig. 5, is a metal ring, which is to be screwed down within or without the nuts of the piston, to keep them from coming off.

Fig. 6, shows the separate parts of the piston rod in section, and the manner in which the piston is connected thereto. By this figure it will be seen that the piston rod is formed of two pipes or tubes, having each a flange, by which the same is affixed to the piston by screws.

It will be desirable here to observe, that in an engine having but one cylinder, it will be necessary to weight the fly-wheel, in order to balance the steam cylinder *d*; but where two cylinders are used, it will be evident that the same may be so applied to the main shaft as that each cylinder shall act as a partial counterbalance to the other, whether the same be for high or low pressure engines.

Having now described the manner of combining the various parts of a steam engine according to my invention, I will explain the manner of its action, in doing which I will suppose the steam to be coming from a steam boiler by the steam pipe *j*, and that the wiper 3, on the main shaft *r*, is acting on the lever *o*, and thus, by the rod *l*, causing the valve *m*, to be lifted off its seat, by which means the steam will pass into the hollow piston rod, and thence into the steam cylinder, between the upper cover of the steam cylinder and the fixed piston, through the valve *h*.

This valve consists of two ground plates affixed on the same spindle, which acts through guide holes formed in bridges across the openings in the piston *g*, as seen in fig. 4.

Thus the upper cover of the steam cylinder having pressed down the valve on to its lower seat, which is also ground, the upper part of the valve is left open for the passage of the steam from the piston rod into the upper part of the cylinder, causing the same to recede from the fixed piston until the lower cover of the steam cylinder comes in contact with the spindle of the valve *h*, and causes the upper part to be closed, and the lower valve to be opened, to admit the steam to flow to the under side of the piston, and to cause it to press the steam cylinder from the fixed piston on that side.

At the same time that the valve *h*, is closed to the upper part of the steam cylinder, and opened to the lower part thereof, the valve *i*, comes in contact with the lower cover of the steam cylinder, and opens the upper part of that valve in such manner that the steam which has already caused the upper part of the cylinder to recede from the piston, passes into the lower part of the hollow piston rod, and thence off, either to a condensor, or to the open air, according to the construction of the engine; and when the upper cover of the steam cylinder again comes in contact with the valves *h*, and *i*, the steam will again flow into the upper part of the cylinder, and the eduction way will be opened for the steam to pass from the under side of the piston, which is the position shown in fig. 3. It is to be observed that it is desirable the spindles of the valves *h*, and *i*, should have springs, or otherwise sufficient friction to prevent their closing when they have been forced into their proper positions, by the covers of the cylinders coming in contact with them.

It has been already described that the steam is admitted by the valve *m*, to the hollow piston rod, and the quantity of steam for each side of the piston is admitted by the wipers 2 and 3, coming in contact with the lever *o*, which is always kept pressed down by the spring 5, and the quantity of steam admitted to each stroke will depend on the time the valve *m*, is kept open, and therefore the length of the wipers 2 and 3, will determine the quantity of steam admitted; and thus may be regulated in case the steam be used expansively the extent of the stroke during which the steam is admitted, and then shut off, that the remainder of the stroke may be completed by the expansion of the steam.

In starting the engine, the lever *n*, is to be depressed by hand, which will open the valve *m*, and admit the steam to the steam cylinder. It will be seen in fig. 3, that there is a division or partition 6, in the piston rod, which divides the same into two parts, the upper one acting as the induction pipe for the steam to the cylinder, and the other, or lower part, as an eduction pipe for the steam from the cylinder.

In case this engine is intended for a low pressure engine, there is to be a pipe leading to the condensor, affixed to the lower part of the piston rod; or when the engine is intended for a high pressure engine, there is to be a pipe affixed, leading to the chimney of the furnace, or to the open air.

In starting the engine, I cause the bottom cover of the steam cylinder to act against the valves *h*, and *i*, which I effect by turning the fly wheel till I bring the crank nearly to the dead point; these valves are thus opened in such a manner that the steam will blow through on both sides of the piston, and thus heat the steam cylinder.

When it is a small engine, I turn, by means of the fly wheel, the cranks over the dead point, in the direction the shaft is to be driven, this will put the valves in their proper position; but in large engines, or where two cylinders are used, (more particularly in marine engines), it will be necessary to be able to change the position of the valves *h*, *i*, at any period of the stroke, for the purpose of changing the direction of the cranks of the main shafts, for the purpose of backing the engines. In this case, I attach rods, such as are shown by dotted lines in fig. 3, to the spindle of the valves *h*, *i*, which pass through stuffing boxes formed on the top cover of the steam cylinders: these rods are connected at the top by a forked lever (see fig. 7), by which means they are moved together.

When it is desirable to change the position of the valves, to alter the direction of the cranks, the throttle valve or cock on the steam pipe from the boiler must be closed, in order to stop the passage of the steam, which will thus stop the engine; the rods connected to the valves *h*, *i*, must then be raised or lowered by the dotted lever, as the case may be, which will raise or lower those valves, and cause them to change the direction of the action of the steam, and consequently the cranks (taking care, if it is a large single engine, not to stop it on the dead points); and in order to remove readily the wipers from under the lever *o*, at any time when the engine is required to be backed, the wipers 2 and 3, are formed on a tube which slides on the main shaft *r*, there being two pairs of wipers thereon, so that when one pair is slided away, the other pair will be so placed as to come into action if required.

Fig. 2, shows the means of moving the wipers. On the tube is formed a clutch, into which enters one end of the lever *b*, and it will be seen that if the lever *b*, be turned on its axis, it will force the tube which carries the wipers along the main shaft, and the tube is prevented from turning by means of a feather, which is well understood.

Having described the manner of combining the various parts according to my invention, and also the manner of their action, it will be evident that although I have described and shown the piston rod as being fixed vertically, the same may, in some instances, be used horizontally, or in a diagonal direction; and I would have it understood that I lay no claim to the various parts separately, of which the engine is composed, they being well known and in use; neither do I confine myself to the precise construction of the various parts as shown in the drawing, as the same may be, in some degree, varied.

What are shown and described I have found to answer, and conceive to be the best arrangement; but what I claim as my invention, is the peculiar arrangement or combination of the various parts of a steam engine, whereby the steam cylinder is caused to be actuated on a fixed hollow piston rod, such hollow piston rod serving as an induction as well as an eduction way for the steam to and from the steam cylinder.—[*Inrolled in the Inrolment Office, September,* 1832.]

Specification drawn by the Patentee.

To Robert James Hendrie, *of Blossom-street, Shoreditch, in the county of Middlesex, dyer, for his invention of an economical mode of improving dyed silk.*— [Sealed 3rd May, 1832.]

The subject of invention claimed under this Patent applies solely to the cleansing of a peculiar kind of silk during the dyeing process.

Silk, which is to be dyed of the colour denominated by the Patentee *Imperial or blue black Dounce*, is dyed in the skein: that is, in bundles or hanks of threads, slightly twisted together. After the silk has been immersed in the dyeing material, a considerable quantity of foul matters are found attached to its fibres, so that a great labour and time is requisite to beat out and wash the silk clean by hand. In order therefore to expedite the operation, and of course render it more economical, the Patentee has discovered that the hand labour may be advantageously superseded by the employment of machinery.

Any kind of washing machinery which will sufficiently beat out and cleanse the material, may be used for the purpose, but the ordinary fulling stocks, such as woollen clothiers commonly apply to washing and milling cloths, are proposed as most eligible. The skeins of silk are put into bags made of *safe canvass*, and when placed in the stock, a continued stream of clean water is allowed to run through the stock during the operation, for the purpose of cleansing the silk perfectly.

The claim of invention is the employment of stocks or other machinery of that kind instead of hand labour, for the washing of silk dyed in the skein of the colour called blue black Dounce.—*Inrolled in the Inrolment Office, November,* 1832.]

To William Daubney Holmes, *of Saint John's Square, in the county of Middlesex, engineer, for his having invented or found out a new method of heating houses and other buildings, and of supplying heat to various manufactures, and other purposes.*— [Sealed 19th July, 1832.]

The subject of this invention is simply the employment of heated oil, or any other liquid, the boiling point of which may be at a higher temperature than that of water, for the purpose of communicating heat by its circulation through a continuous range of pipes placed round a building, in the same way that water has been recently employed for warming rooms, manufactories, and hot houses.

It has been long known that oil, under the ordinary atmospheric pressure, will retain a very considerably greater quantity of heat than water before it passes into the state of vapour or steam. Taking advantage of this knowledge, Messrs. Severn, King, & Co. of Whitechapel, formerly surrounded their sugar pans with boiling oil as a heating medium, which mode of evaporating syrups they continued to practise until the unfortunate and memorable explosion of the oil, which, with its attendant conflagration, totally destroyed their premises.

The employment of heated oil, as proposed by the Patentee, is not confined to any particular shape or construction of apparatus, as its application to heating is claimed generally under every from in which a continuous current of the fluid can be obtained. But for the purpose of illustration only, the plan of an oven to be heated by a continuous range of pipes conducting heated oil, is appended to the Specification.

Plate V. fig. 8, represents the contrivance as it would appear in a horizontal or plan view; *a*, is the oven surrounded by a double casing *b, b, b, b,* which forms a chamber or vessel to be filled with oil; *c, d, e,* is a continuous range of pipes leading from the bottom part of the chamber *b,* at *c,* and delivering into the top part of the chamber *b,* at *e.* A vessel of oil is placed at *f,* from which the pipes and the chamber may be filled, and *g,* is a valve to let off the air which may previously occupy the pipes.

In some convenient part of the range a furnace or heating stove is to be applied to the pipe, by which the temperature of the oil will be raised, and consequently from the levity it has then acquired, will flow up the ascending pipe and enter the chamber *b,* or the upper part *e;* then circulating round the chamber as shown by the arrows, it will give out its heat to the oven *a,* and being slightly reduced in temperature, will descend by its superior gravity, and pass off at *c,* through the continuous range of pipes *d, d, d.*

The oil becoming heated in its course through the range of tubes *d, d,* by the fire of the stove or furnace, it will by its increased temperature again pass up into the vessel at *e;* a continuous current of the heated fluid will then be produced, which will effectually heat the oven in passing round.

For the purposes of baking, the Patentee proposes to raise the temperature of the oil to 400° Farenheit, but for other purposes, of course the degree of heat required will depend upon particular circumstances: and the employment of oil as a heating medium affords the ready means of regulating the temperature to any degree that may be desired.—[*Inrolled in the Inrolment Office, December,* 1832.]

To Miles Berry, *of Chancery Lane, in the parish of Saint Andrew Holborn, in the county of Middlesex, civil engineer, and mechanical draftsman, in consequence of a communication made to him by a certain foreigner residing abroad, for certain improvements in the construction of presses applicable to various purposes.*—[Sealed 26th July, 1832.]

These improvements in the construction of presses applicable to various purposes, consist in the adaptation of *rotary toggle joints*, or *jointed levers*, placed upon a revolving shaft, which when brought into a right line, effect the pressure upon the article submitted to its operation.

This mechanism is applicable to various kinds of presses employed for making nails or rivets, heading screw-shafts, bolts, or pins, making buttons, coining money, striking dies upon metals, and embossing cards or paper, and other materials; the improvements consisting in obtaining the pressure by means of rotary arms with toggle joints, or jointed levers, in any kinds of presses to which the same may be applicable.

As the minute parts or details of the press must necessarily vary according to the description of press to which these improvements are to be adapted, and the kind of work intended to be performed, it is only necessary to describe a simple application of these improvements in a press which may be used for coining money, or stamping, or striking dies.

The several figures in the accompanying drawing (see Plate V.) and the following description will sufficiently explain the principles and action of the rotary toggle joints, or jointed levers, in producing the required pressure upon the article to be struck in the press.

Fig. 9, is a front elevation of a press; and figs. 10, 11, and 12, are side views of the same, partly shown in section; that is, one of the side frames being removed in order to exhibit the different positions of the mechanism more perfectly; the same letters of reference being marked on similar parts in all the figures.

The frame work of the press repesented at *a*, *a*, *a*, may be made of metal or wood, and constructed to suit the particular purpose for which it may be intended to be used; *b*, is a shaft, mounted in suitable bearings in the side frames, and turned by a winch or other convenient means. Upon this shaft is securely fixed the arm, or lever *c*, carrying the toggle joint, and the outer lever *d*; at the extremity of which lever is placed the stamp, die, or cutter; *e*, is another shaft, also mounted in bearings in the side frames, and from which extend the arms or block pieces *f*, *f*, having the under or counter dies at their extremites.

The ends of these arms or blocks are alternately brought into contact with the upper die, as they both revolve by means of the toothed wheel *g*, mounted upon the shaft *e*, taking into another toothed wheel *h*, upon the shaft *b*, of half its diameter, which causes the shaft *b*, to revolve with twice the velocity of the shaft *e*.

A holder or piece of metal *i*, counter sunk or otherwise formed for the upper die, is placed between guides *k*, *k*, fixed on the outer toggle lever *d*, and which die holder *i*, is allowed to slide up and down within the guides, and is forced downwards by the action of a helical spring *l*, coiled round the outer toggle lever *d*, within the guides; as may be seen in the detached view of the outer toggle lever, fig. 13, where the guides are removed from one side, and the helical spring *l*, shown in section the better to expose the parts, and a small ledge upon the ends of the guides *k*, (see fig. 9), prevents the spring *l*, from projecting the die holder *i*, beyond its place.

In order that the two dies as they revolve may meet each other fairly and correctly, the outer toggle lever *d*, with the die holder *i*, is pitched forward at an angle so as to bring it into a right line with the centres of the block pieces *f*, as they come up to the point of meeting (as shown in fig. 10.) This inclined position of the lever is produced by the force of the spring *m*, fixed upon the boss of the inner toggle lever or arm *c*, the end of the spring *m*, being connected by a bridle piece *n*, to the outer toggle lever, as shown in the figures, and by these means the lever is returned in the inclined position, after each impression has been given. The extent of this obliquity of the toggle lever *d*, is determined by a regulating screw *o*, on the end of the arm *p*, fixed upon the outer toggle lever, which screw comes in contact with the inner toggle lever between each impression.

On the wheels *g*, and *h*, being put into motion by a winch or other means in the direction of the arrows, the shafts *b*, and *e*, will revolve in opposite directions; and in consequence of the difference of the diameters of the wheels, the toggle levers *d*, will revolve with double the speed of the block pieces *f*, *f*.

By this rotation of the two wheels and their shafts, the block pieces *f*, *f*, carrying the lower dies, are alternately brought into contact with the die holder *i*, at the end of the outer toggle lever *d*, which are the periods of the dies coming into operation.

On the die holder *i*, at the end of the toggle lever *d*, meeting one of the block pieces *f*, the ends of the guides *k*, *k*, first strike against a transverse pin *q*, fixed at the back of each block piece *f*, and as the rotary progress of the block piece *f*, is slower than that of the toggle levers, it follows that the outer toggle lever *d*, will be retarded, and forced by the resistance of the pin *q*, against the guides *k*, *k*, into a perpendicular position, as at fig. 11, the guides *k*, *k*, sliding against the pin *q*, the spring *m*, bending, and the press now exerting its maximum of power.

The pinch of the dies or cutters fixed at *i*, takes place in the line of the centres of the toggle joint as it passes the centre of the block, and of the shafts or axles, and by these means a central impression is given by the dies to the material operated upon.

Fig. 10, as before said, shows the positions of the parts of the press at the period that the block first meets the upper die holder, which is thrown outwards to meet the counter die, by the action of the helical spring *r*. Fig. 11, shows the position of the press at the period that the toggle joints and blocks are passing the centres, and the dies are giving the impression, the die holder *i*, being forced against the end of the outer toggle lever *d*, by the resistance of the block piece *f*, the helical spring *l*, giving way to the pressure. Fig. 12, shows the press after the impression has been struck, and the toggle joints and block have passed the centres, the toggle levers *c*, and *d*, moving round to meet the other block piece *f*, as it rises, when they will act in the same way as described, and produce another impression.

The size of the toothed wheels and their proportions to each other, the length of the toggle levers and block pieces, the relative speed of one shaft to the other, the number of toggle joints or levers, and the number of block pieces, may all be varied by different arrangements and proportions, retaining however the same principle of action in the process.

The materials to be impressed, stamped, struck, cut, or otherwise operated upon, may be placed in either the upper or lower die, or between the two, or introduced or fed into the press by hand, or by any convenient machinery, such as a feeding table, which may be brought between the toggle levers and block pieces after each impression, bythe motion of a crank or lever ; but as the manner of feeding or introducing the material into the press must vary according to the character of the material operated upon, and description of work to be performed, it is not necessary to describe any particular mode of effecting the same.

The improvements claimed under the above Letters Patent, are the application of rotary toggle joints, or jointed levers, in connexion with the blocks or other such necessary resisting parts to produce the required pressure in the manner herein described, and the adaptation of the said contrivance to all presses to which the same may be applicable.—[*Inrolled in the Rolls Chapel Office, January,* 1833.]

Specification drawn by Messrs. Newton and Berry.

To JAMES PYCROFT, *of Rolleston, near Burton on Trent, in the county of Stafford, gentleman, for his invention of certain improvements connected with grates, and other fire places.*—[Sealed 13th July, 1831.]

THIS invention consists in a particular arrangement and construction of grates or fire places, whereby much of the heat heretofore lost, is made available in heating a quantity of air, either from the room in which the fire is contained, or from an inlet from the outer atmosphere ; and such heated air may pass into the same room in which the fire is contained, or be conveyed to other rooms as may be desired.

In order to carry the invention into effect, the Patentee says, he constructs the sides, top, and part of the back of the grate or fire place hollow with proper inlets and outlets for the air to such hollow chambers.

In Plate V. fig. 14, represents the front view of a grate or fire place, constructed according to my improvement. Fig. 15, is a side section thereof, and fig. 16, a horizontal section. In each of these figures *a*, is the fire place for the fuel; *b*, *b*, are the registers or inlets for the cold air, when such air is derived from the room; *c*, *c*, are outlets for the air when it has become heated, by passing into the hollow chambers *d*, *d*, formed at the sides, back, and top of the grates or fire places; *e*, is the flue, which is shown as being of a rectangular form, but other forms may be used.

This flue it will be seen, stands back from the fire, the fire being brought as forward as possible, with a view to throwing as much heat as can be into the room; yet as such bringing forward of the fire would tend to cause the smoke to enter the room in place of going up the chimney, and in order to prevent this, I use a shield or cover, which will descend and cover the upper part of the fire, and which at the same time acts as a blower to excite the fire; *f*, is the front part of the cover, which is hinged to the upper part of the grate or stove, on the inner side of which the part *g*, slides, so as to elongate the cover or shield, when the same is drawn outwards for the purpose of covering the fire, as shown by the dotted lines in fig. 15.

This part *g*, has slits cut into it, and also pins or studs formed in the inner side of the part *f*, which allows of its being drawn down, but it is yet retained in any position, by means of a screw pin on the top of the shield and rack affixed on the side of the part *f*, as shown in the figure.

When the fire is lighted, and fresh coal put on, the cover or shield *f*, *g*, should be drawn down so as to close the upper part of the fire, and thus will the black smoke be directed up the chimney; and when the coal has burned up, the cover or shield may be slided up, and be placed level with the surface of the back of the stove, and only leave a small place for the smoke to pass to the chimney.

It will be evident that so long as a fire is in the grate or fire place, the air which is contained in the hollow chambers will become heated, and will pass off at the openings or outlets *c*, *c*, into the room.

In case the air so heated be desired to be passed into other rooms, then the outlets *c*, *c*, are to be closed, and apertures into tubes or pipes, placed for that purpose, are to be opened, when the heated air will pass into any other room which is connected by pipes for that purpose.

In place of permitting the air of the room to enter into the flow chambers *d*, *d*, I generally use pipes connected with the hollow chambers, and open to the outer atmosphere, in which case the apertures *b*, *b*, must be opened; *h*, is a damper placed a short distance up the chimney or flue, by which the extent of draft may be regulated, or wholly shut off when required; *i*, is a small door, through which the hot air may be conveyed into the chimney when not wanted.

Having now described the nature of my invention, and the manner of performing the same, I would have it understood that what I claim as my invention is the forming hollow chambers to grates or fire places in the manner above described, for heating the air either of the room in which the fire is lighted, or for supplying such heated air to other rooms by means of pipes connected therewith; also the particular construction and arrangement of the bonnet or shield with hinges, applied to such hollow chambers.—[*Inrolled in the Inrolment Office, January,* 1832.]

To Peter Young, *of Fenchurch-street, in the city of London, rope and sail maker, in consequence of a communication made to him by a certain foreigner residing abroad, for an invention of a new mode of manufacturing mangel-wurzel, for the purpose of producing various known articles of commerce.*—[Sealed 6th October, 1831.]

The intention of the Patentee is to employ mangel-wurzel or beet-root, as a material for producing first, a liquor for the purposes of distillation, and from which a pure spirit may be obtained; secondly, a wash to be converted into vinegar; and thirdly, a pulp from which paper may be manufactured.

In adapting the mangel-wurzel to these purposes, the roots are first to be washed, and scoured perfectly free from dirt, then the rind is to be taken off by rasping, and it is to be placed in cloths or bags, made of twilled woollen, or horse hair, and submitted to pressure by means of an hydraulic press, or other suitable means, for the purpose of expressing the juice.

The juice thus extracted is to be placed in a boiler, and its temperature raised to somewhere about the boiling point; and with it is to be mixed and well stirred up a quantity of diluted sulphuric acid, in the proportion of about ten ounces of acid to one hundred gallons of the juice.

After about twelve hours, the juice is to be drawn from the boiler into a vat, and allowed to cool, which cooling may be expedited by the use of a refrigerator. When the liquor is reduced in temperature to about 70° Fahrenheit, then lime or other alkaline matter is to be introduced into it for the purpose of neutralizing the acid, which material must be continued to be applied until the liquor ceases to effervesce. Yeast is then to be added for the purpose of causing the liquor to ferment, and when the fermentation has been carried on as long as it will act, the liquor is considered to be ready to be operated upon by the still, by which a very pure and fine spirit may be obtained.

The pulp of the mangel-wurzel which remains in the bags may be steeped in water, and being again submitted to pressure will give out a liquor, that if mixed with a portion of sugar, may be employed for making vinegar by the ordinary process.

The fibrous parts of the root after the steeping and pressing, are to be washed with diluted sulphuric acid or chlorine, in order to bleach them, and this being done, the chemical matters washed perfectly away, the pulp will be found in a state fit to be employed for making paper.

The quality of the paper produced from this material will be improved by mixing with it from ten to fifty per cent of fine linen rags, which will render it fit for making fine white or coloured papers; if it is mixed with ropes or hemp, it may be converted into brown or other common papers.—[*Inrolled in the Inrolment Office, April,* 1832.]

AMENDMENT OF THE LAWS

RELATIVE TO

PATENTS FOR INVENTIONS.

In consequence of notice given in the House of Commons by Mr. Godson, the Member for Kidderminster, of his intention to introduce a Bill into Parliament for altering and amending the laws which apply to Patent Inventions, an article appeared in the Times newspaper, purporting to be a sketch of the plan about to be proposed by the Hon. Member.

Considering it desirable to call public attention to this subject, we inserted in that paper, as a reply, the following letter, which will sufficiently show our views upon the general question:—

TO THE EDITOR OF THE TIMES.

SIR,—Seeing an article in your paper of yesterday, pointing out the objects of Mr. Godson's Bill, about to be submitted to Parliament for amending the laws relating to patents for inventions, we take the liberty of offering a few observations on that subject.

It is a matter of great importance, in a country like this, in which inventive talent so eminently flourishes, to obtain a code of laws which shall give to the productions of scientific genius the same protection that is afforded to literature, and to remove every impediment which may obstruct the growth of improvements in our arts and manufactures.

In proposing, however, remedies for existing evils, we must not stumble over shadows, but attack those defects in the existing system which really operate as grievances, and produce extensive injury. You say "the principal improvement contemplated appears to be in the mode of obtaining the patent and the description called the specification. Inventors have long and loudly complained that their time was wasted by journeys to the office of the Secretary of State, the Privy Seal, and the Signet." If such should be the primary objects of the Bill, it is founded ed in error. Is it not a matter of grievance to patentees that they have to travel to and fro, through a series of offices, at great labour and inconvenience, before they obtain the great seal; this drudgery is performed by the clerks of the patent agents, and it is perhaps a labour which few patentees are aware of occurring.

In seeking to supersede this unnecessary parade of offices we should be attacking vested rights of many persons, and the ancient prerogatives of the Crown; let us, therefore, leave these matters to be dealt with by the law officers as they see fit; on this point we only ask a *reduction of the exorbitant fees and stamps* charged in obtaining a patent, which operate as a severe tax on ingenuity, and too often crush the efforts of humble genius.

The important feature sought to be obtained is a certain code of laws for the protection of new inventions and discoveries, by which the intentions of the Legislature may be clearly seen, instead of leaving all questions relative to this kind of property to be decided by precedents in our courts of law, or by the varying opinions of the judges of the day.

To strike out a scheme which should meet all the exigencies of the case would extend this letter beyond a reasonable limit; as, however, we are tolerably well acquainted with the defects of the existing laws, and also with the opinions of patentees in general, in different parts of the kingdom, we shall probably, at a future day, find occasion to solicit your insertion of some further remarks on this subject, for the purpose of eliciting the views and opinions of those who are most interested in patent property.—We are, Sir, yours, &c.

NEWTON AND BERRY.

Office for Patents, Chancery-lane.

Subsequently to this, Mr. Godson has obtained leave to bring in a Bill for the purpose of amending the Laws relative to the granting of Patents, and the practice of the Courts in examining such subjects. The Honorable Member explained his proposed Bill at considerable length, and which indeed we may consider to be tantamount to reading the Bill itself.

He first recited the Act of James I, respecting monopolies, for the purpose of repealing the 6th Section of that Act, and proposed that all future monopolies respecting inventions shall be void, except such as shall be granted under and by authority of the new Act, about to be submitted to Parliament.

That doubts having arisen respecting the persons to whom Patents ought to be granted, they having been heretofore confined, first, to the discoverer of a new thing; second, to the publisher of a new invention; and third, to the introducer of a foreign invention, proposed that in addition to the above class of persons, an inventor in England may communicate or sell his invention to any person in England, who shall be at liberty to take out a Patent here in his own name, and hold the same as his exclusive property under the same law that would secure it to the inventor himself.

That doubts having arisen respecting the subjects for which Patents ought to be granted, and the obvious impossibility of enumerating every subject, also as to the extent of the use of a thing which may prevent its being legally the sublect of a Patent, it is proposed to enact, that, first, all new substances or things made; second, all new machines; third, all new additions or improvements of machines or things; fourth, all new combinations or arrangements of things already known; fifth, all methods or processes by which a newly discovered principle or application is carried into practice by tangeable means; sixth, all chemical discoveries which result in or produce an article of commerce, shall be proper and legitimate subjects for Patent Right.

It is also to be provided that a Patent shall not become void because the article may have been used in some particular part of the United Kingdom in an imperfect manner, unless it has continued in public use to within ten years; and it is further to be provided, that any experiments which have been made by the Patentee, or on his behalf, shall not be deemed a public use of the invention.

That many Patents having been declared void, and great expense and loss of labour having arisen from the strict rules by which the Titles to Patents, and the Specifications of the Inventions have been construed, it is proposed that the court or judge before whom any proceedings at law may be taken upon any Patent for Inventions, shall have power to amend the Title or Specification in all matters of form or description which could not have misled a person acquainted with the subject, and that it shall be a question for the jury to decide whether any supposed omission in the description has been wilfully made; and if the jury find that it has not been wilful, then the Patent shall continue valid; but the Patentee shall be required immedi-diately to enroll another Specification supplying that omission.

That the inventor may deposit a model of his machine, or a pattern of his invention, in some public buildings (to be agreed on,) and that the model may be produced in evidence in any Court of Justice. And it is also proposed, that if a Patent in which several things are included be bad as to part, it shall not be bad as to the whole; but the inventor shall be bound to enrol another Specification omitting the parts that are bad.

That the present mode of obtaining a Patent is most irksome and injurious to inventors; it is therefore proposed to enact, that the petition of the inventor shall be accompanied with a preparatory Specification describing the invention in general terms, which shall be sealed up and carried with the petition to the Office of Patents, where proper officers shall attend, who shall immediately carry the same to the office of the Attorney General or Solicitor General, who shall proceed thereon, without any reference back to the Secretary of State, and that the Attorney or Solicitor General shall direct the Letters Patent to be made out, without the forms of the Bill passing through the offices of the signet and privy seal, and without the sign manual of the King being required: and that the Lord Chancellor shall be authorized by the fiat of the Attorney General, or Solicitor General, to put the Great Seal to the Patent. And it is further to be enacted, that the Specification shall be enrolled as heretofore with drawings, but with a reference to the place where the model (if any,) is deposited.

It is proposed, that the Attorney or Solicitor General shall call in two Examiners to assist him.

That great abuses having sprung up from the liberty given of entering caveats in Chancery and the offices of the Attorney or Solicitor General, and many inventors having been injured by the secret of their inventions having transpired before the patent was granted, it is to be enacted that no more caveats, as at present, shall be entered at those offices; but that on a petition being presented for a Patent, the same shall be published in the next *Gazette*, in order to give notice to all parties who may be concerned, that they may come forward and enter their opposition to such Patent within seven days, and that the Attorney or Solicitor General do receive such opposition, and consider the same before he issues his fiat to the Great Seal; and that the Letters Patent shall bear date from the day of presenting the petition, or from the report of the Attorney General.

That the costs and expenses of obtaining Letters Patent are unnecessarily increased when taken out for Scotland and Ireland, it is to be enacted that an inventor in England, upon lodging his petition at the Patent Office in London, shall be entitled to Patents for Scotland and Ireland, within a stated time, without further trouble or application, and that the like may be done in Edinburgh by persons in Scotland, and in Dublin by persons in Ireland.

That great doubts are entertained whether the amount of money paid for Patents, could with advantage to the public be lessened. (He proposes as is opinion, that for a 14 years patent half the present sum would be sufficient;) it is to be enacted that the sum of £—— shall be paid by the inventor at the time of depositing his petition, and the sum of £—— upon the receipt of the Letters Patent, and that it shall be the duty of some person in the Patent office to pay over to each person at present entitled to fees, a certain sum of money to be fixed on.

That improvements upon an existing Patent may be secured by paying a certain fee or stamp duty, and inrolling a Specification of the particular of the invention in its more matured form.

That the property in Letters Patent is unnecessarily abridged without any corresponding advantage to the public, and it is proposed to be enacted that the Letters Patent shall only be granted to one person, but that he shall be at liberty to assign his interest in any manner, and to any number of persons as he may think best to his own advantage.

That great delay, inconvenience, and expense have arisen in consequence of a patentee being often obliged to sue for an injunction in the Court of Chancery, whilst he has a suit defending in a Court of Common Law, it is therefore proposed to be enacted that every party to a suit in a Common Law Court, may by motion in that Court obtain an injunction or other redress, as an inspection of a machine, which would be allowed to him in a suit in a Court of Equity; and it is also to be enacted that the venue may be changed from Middlesex to the county in which the witnesses reside, at the discretion of the Court.

That the proper method of cancelling Letters Patent by writ of *scire facias* is very expensive, it is therefore proposed to be enacted, that after a verdict has been pronounced against a patent right, the party to the suit may apply to the Court in Bank, who shall have power to direct that the Letters Patent be cancelled; and that the writ of scire facias as to patents for inventions be accordingly abolished.

These are the features of Mr. Godson's Bill which has been presented to the House, but is not yet printed.

The Attorney General spoke at some length, and expressed his approbation of any suitable measure which might be proposed for giving greater security to Patent property, and also for obtaining Patents at a cheaper rate; but as he had not yet seen the Bill, he did not pledge himself to support all its clauses.

Mr. Lennard, Chairman of the former Committee on Patents, supported the introduction of the Bill, and pledged himself to give it his utmost attention. He considered that inconvenience might arise from granting Patents at too small a cost, but wished the subject to be referred to a Committee up stairs, where, (if we understand him right) a Bill was already prepared for a similar object.

Mr. Warburton followed, expressing his opinion that the inconvenience and injury to which Patentees were at present subjected called loudly for correction, and urged that the Bill be sent to a Select Committee for revision, convinced that by so doing a very complete code might be produced, which should perfectly satisfy the House and the country.

Mr. O'Connell hoped that the measures of relief might be extended to his country, and that a Patent, whether granted in England, Ireland, or Scotland might extend over the whole of the United Kingdom.

It is intended that sufficient time shall be given to the members to consider the subject, and therefore the second desired is not to take place until the 24th April, the Act to go into force on the 1st November, as to the new mode of granting Patents, and for any legal proceeding as respects existing Patents, and imperfect Specifications to be retrospective.

There are,it will be perceived,some points in the proposed measure of great value, and fully calculated to answer the desired purpose ; there are also others with which it is unnecessary to encumber the Bill—some that it would be highly improper to enact, and some that are utterly impracticable. It is, however, unnecessary, before the Bill is in the hands of the public, to give a decided opinion upon any of its clauses ; it shall however have our best consideration and support as far as it may appear calculated to remedy existing evils. But we strongly recommend to those who are interested in this measure, instead of heaping letters of advice, or pamphlets, upon the table of the Hon. Gentleman, the projector of the Bill (and which his professional avocations render it impossible for him to read) to call public meetings in their own localities, for the purpose of convassing the several parts of the Bill, and eliciting the opinions of experienced Patentees, by which means, the Bill in an amended form, might be presented to the House in the shape of petitions, numerously signed from Manchester, Leeds, Birmingham, and other important manufacturing places, which would come with the character of much intelligence, and in so forcible a shape that Parliament could not resist the conviction, that in following the advice of such well informed and experienced petitioners, they must inevitably produce a code of laws, eminently calculated to protect the interests of the arts, the manufacturers and the commerce of the empire.

AMERICAN PATENTS.

For an improvement in the *manufacture of Gas for illuminating purposes*; Joseph Barton, city of New York.

Be it known, that I, Joseph Barton, have discovered a new and useful improvement in the manufacture of gas‘ for illuminating purposes, and of a portable nature, and that the following articles are used as a combination to produce said gas without smell, viz.

Tallow, spirits of turpentine and rosin fused together, and decomposed through red hot tubes.
Turpentine and alcohol, do. do.
Coal tar and rosin, do. do.
Coal tar and tallow, do. do.
Coal tar, tallow, and rosin, do. do.
Seneca oil, coal tar, tallow, and rosin, do.
India rubber and Hydro carbons, do. do.
Oil of turpentine and rosin. do. do.

For a machine for *Felting and Napping Hats;* Thomas J. Cornell, Randolph county, Vermont.

The hat body is to be bowed, set up, and basoned in the usual manner; it is then to be rolled up in the sticking cloth, when it is ready to be operated upon by the machine, which consists principally of a vibrating rack, and a revolving apron. The machine is placed over the kettle, into which a pump passes, the piston of which is operated upon by a part of the machinery, and supplies the hot liquid necessary to the operations of felting or napping. The structure of the different parts, and the gearing employed, cannot be described without drawings. The claim is to "the method of felting and napping of hats by means of a vibrating rack and a revolving apron."

For an improvement in the *Manufacture and Setting of Porcelain Teeth;* Samuel Chamberlain, city of Philadelphia.

Pieces of platina wire are imbedded in the composition of which the tooth is made, previously to its being baked: these wires project from the top of the tooth, and to them the gold plate is to be soldered by which the tooth is to be attached. There are some other points which are considered improvements, as will be seen by the claim.

What I claim as new, and as my discoveries and inventions, are the glazing or enamelling the inside of the tooth and polishing the gold plate, so that no unpleasant roughness may be presented to the tongue, and the tooth may not absorb moisture from the mouth.

“ The manner of fixing the tooth by means of the pieces of platina and gold plate, and by soldering the spring that secures the tooth in the mouth to both the gold plate and the plug in the top of the tooth, which fixes the whole more firmly.

“ The method of securing the tooth differs from all others in this essential particular, that is, that there is no interstice between the plates, or between the plate and the tooth, for food or moisture to collect.”

◆

New Patents

SEALED IN ENGLAND.

1833.

To John M'Curdy, of Southampton Row, in the county of Middlesex, Esq. for his invention of certain improvements in machinery, for acquiring power in rivers and currents, partly communicated by a foreigner.—Sealed 22d January—6 months for inrolment.

To Luke Hebert, of Paternoster Row, in the city of London, civil engineer, for his invention of certain improvements in machines or apparatus for, and in the process of manufacturing bread from grain, and the application of other products or another product thereof to certain useful purposes.—Sealed 24th January—6 months for inrolment.

To John Warner, the younger, of the Cresent, Jewin Street, in the city of London, brass founder, for his invention of certain improved processes in giving a metallic coating to various articles of commerce.—Sealed 24th January—6 months for inrolment.

To Robert Stephenson, of Newcastle-upon-Tyne, in the county of Northumberland, engineer, for his invention of certain improvements in the locomotive steam engines now in use, for the quick conveyance of passengers and goods upon edge railways.—Sealed January 26th—6 months for inrolment.

To William North, of Stangate Wharf, Lambeth, in the county of Surrey, slater, for his invention of an improvement in roofing or covering of houses or other buildings, or places.—Sealed 29th January—6 months for inrolment.

To John Samuel Dawes, of Badford Works, West Bromwich, in the county of Stafford, iron master, for certain improvements in the manufacture of iron.—Sealed 29th January—6 months for inrolment.

To Richard Butler, of Austin Friars, in the city of London, merchant, for his improvements in manufacturing, obtaining, or producing oil from certain substances; and in extracting, producing, or obtaining gas from the same or such like substances, or from the oil produced therefrom.—Sealed 29th January—6 months for inrolment.

To Edwin Appleby, of Doncaster, in the county of York, iron founder, for his invention of certain improvements in steam engines.—Sealed 29th January—6 months for inrolment.

To John Reehead, of Henry Street, Vauxhall, in the parish of Lambeth, in the county of Surrey, Esq. for his invention of certain improvements in the construction of coaches, waggons, or other carriages used for the transporting or conveying goods and passengers, to be drawn by horses, or propelled by steam, or other motive power.—Sealed 29th January—6 months for inrolment.

To John Linton, of Selby, in the county of York, brazier, for his invention of an improved construction of steam boilers.—Sealed 29th February—6 months for inrolment.

To Josiah John Guest, of Dowlais Iron Works, Merthyr Tydvil, in the county of Glamorgan, Esq. for an improvement in the process used for producing from iron ore, and other materials containing iron, what is called in the iron trade, finers.—Sealed 31st January—4 months for inrolment.

To James Lutton, of Dean Street, Soho, in the county of Middlesex, chair maker, for his invention of certain improvements in easy chairs.—Sealed 31st January—2 months for inrolment.

To Jonathan Dickson, and James Ikin, both of Holland Street, Blackfriars Road, in the county of Surrey, engineers, for their invention of improvements in the process of making gas from coal or other substances.—Sealed 6th February—6 months for inrolment.

To William Crofts, late of Lenton, but now of Radford, both in the county of Nottingham, mechanic, for his invention of certain improvements in certain machinery for manufacturing of bobbin net lace.—Sealed 11th February—6 months for inrolment.

To William Crofts, late of Lenton, but now of Radford, both in the county of Nottingham, mechanic, for his invention of an improved mode of combining together, and actuating certain parts of machinery already known and used for making lace, commonly called bobbin net.—Sealed 11th February—6 months for inrolment.

To Edward Lucas, of Edward Street, Birmingham, in the county of Warwick, engineer, for his invention of a self-acting force and lift pump.—Sealed 11th February—6 months for inrolment.

To James Brown, of Margaret Street, Commercial Road, in the county of Middlesex, rigger, for his invention of certain improvements in capstans, and apparatus to be used therewith.—Sealed 14th February—6 months for inrolment.

To William Rhodes, of the Grange, Leyton, in the county of Essex, brick maker, for his invention of an improved manufacture of bricks for building purposes.—Sealed 11th February—6 months for inrolment.

To Thomas Robinson Williams, Esq. late of Norfolk Street, Strand, for his invention of a new combination of fibrous materials, forming by means of machinery artificial skins, which may be applied for the purposes for which skins, leather, vellum, and parchment are now used.—Sealed 11th February—6 months for inrolment.

To Luke Hebert, of Hampstead Road, in the county of Middlesex, civil engineer, and James Don, of Lower James Street, Golden Square, in the city of Westminster, for their invention of certain improvements in engines and other machinery employed in the construction of steam vessels and steam carriages, a portion of which improvements is applicable to other purposes, part of which improvement was communicated by a foreigner.—Sealed 21st February—6 months for inrolment.

To Thomas Hills, the younger, of Saint Michael's Alley, Cornhill, in the city of London, gentleman, for his invention of certain improvements in furnaces for steam boilers, and other useful purposes.—Sealed 21st February—6 months for inrolment.

To Alexander Gordon, of the Strand, in the county of Middlesex, engineer, for certain improvements in the boilers or generators of steam or vapour, and in condensing such steam or vapour, and in engines to be worked by steam or vapour, for propelling or actuating machinery and carriages on land, and boats or vessels, or other floating bodies on water, being a communication made to him by a certain foreigner.—Sealed 21st Feb.—6 months for inrolment.

To Robert Hicks, of Wimpole Street, in the county of Middlesex, Esq. for his invention of an improved method of, and apparatus for, baking bread.—Sealed 21st February—6 months for inrolment.

To John Thompson, late of the London Iron and Steel Works, Parade, Thames' Bank, near Chelsea, in the county of Middlesex, but now of Newhall Street, Birmingham, in the county of Warwick, Esq. for his invention of improvements in the steam engine.—Sealed 28th February—6 months for inrolment.

CELESTIAL PHENOMENA, FOR MARCH, 1833.

D.	H.	M.	
1	0	0	☉ rises 6 h. 48 m. sets 5 h. 38 m.
	—		☽ rises 11 h. 51 m. A. M. sets 3 h. 22 m. A. M.
5	0	0	☽ pass mer. 11 h. 55 m.
	—		Clock before the ☉ 11 m. 45 s.
5	16	46	Ecliptic opposition or ○ full moon.
6	0	0	Mer. R. A. 23 h. 21 m. dec. 5. 41. S.
	—		Ven. R. A. 1 h. 56 m. dec. 14. 27. N.
	—		Mars R. A. 4 h. 46 m. dec. 24. 43. N.
	—		Jup. R. A. 0 h. 22 m. dec. 1. 9. N.
	—		Sat. R. A. 11 h. 47 m. dec. 4. 5 N.
	—		Georg. R. A. 21 h. 31 m. dec. 15. 27. S.
	—		Vesta R. A. 18 h. 6 m. dec. 19. 6. S.
	—		Juno R. A. 15 h. 37 m. dec. 7. 52 S.
	—		Pallas R. A. 1 h. 13 m. dec. 8. 39. S.
	—		Ceres R. A. 2 h. 59 m. dec 14. 18. N.
6	0	0	Venus elong. max. E. 46. 19.
6	8	43	☾ in conj. with ♄ loug. 25. 25. Virg. ☾ lat. 4.30. N. ♄ lat. 2. 27. S. diff. of lat. 2. 3.
8	0	0	Remarkably high tide may be expected about this time, if not impeded by wind.
10	0	0	☉ rises 6 h. 28 m. sets 5 h. 54 m.
	—		☾ rises 11 h. 33 m. p. m. sets 8 h. 42 m. A. M.
	—		☾ passes mer. 16 h. 15 m.
	—		Clock before the ☉ 10 m. 30 s.
11	13	0	Venus in perihelio.
12	17	47	☾ in □ or last quarter.
14	22	0	☿ in north node.
15	0	0	☉ rises 6 h. 17 m. sets 6 h. 3 m.
	—		☾ rises 3 h. 41 m. A. M. sets 11 h. 49 m. A. M.
	—		☾ passes the meridian 20 h. 24 m.
	—		Clock before the ☉ 9 m. 8 s.
	—		☉ and ♄ in opposition.
16	2	0	☿ in conj. with ♃ long. 8. 20. Aries, ☿ lat. 12. N. ♃ lat. 1. 6. S. diff. of lat. 1. 18.
16	22	0	☾ in Apogee.
18	0	0	Mer. R. A. 0 h. 43 m. dec. 5. 19. N.
	—		Veuus R. A. 2 h. 39 m. dec. 19. 16. N.
	—		Mars R. A. 5 h. 12 m. dec. 24. 57. N.
	—		Jupiter R. A. 0 h. 32 m. dec. 2. 17. N.
	—		Saturn R. A. 11 h. 44 m. dec. 4. 28. N.
	—		Georg. R. A. 21 h. 33 m. dec. 15. 15. S.
	—		Vesta R. A. 18 h. 26 m. dec. 19. 6. S.
	—		Juno R. A. 15 h. 38 m. dec. 6. 54. S.
	—		Pallas R. A. 1 h. 39 m. dec. 7. 23. S.
	—		Ceres R. A. 3 h. 14 m. dec. 15. 55. N.
19	12	0	☿ in perihelio.
20	0	0	☉ rises 6 h. 5 m. sets 6 h. 11 m.
	—		☾ rises 6 h. 0 m. A. M. sets 5 h. 3 m. P. M.
	—		Clock before the ☉ 7 m. 39 s.
20	8	6	☉ enters Aries.
20	23	0	Ecliptic conj. or ● new moon.
21	17	30	☽ in conj. with ♃ long. 9. Aries. ☽ lat. 4. 53. S. Jupiter lat. 1. 6. S. diff. of lat. 3. 47.
22	11	20	☽ in conj. with ☿ long. 18. 43. Aries. ☽ lat. 5. 1. S. ☿ lat. 1. 26. N. diff. of lat. 6. 27.
24	19	20	☽ in conj. with ♀ long. 18. 35. Taur. ☽ lat. 4. 26. S. ♀ lat. 4. 5. N. diff. lat. 8. 31.
25	0	0	☉ rises 5 h. 54 m. sets 6 h. 19 m.
	—		☽ rises 7 h. 57 m. A. M. sets 10 h. 53 m. P. M.
	—		☽ pass mer. 3 h. 12 m.
	—		Clock before the ☉ 6 m. 7 sec.
28	10	44	☽ in □ or first quarter.
28	0	0	☿ elong. max. 18. 56.
30	0	0	☉ rises 5 h. 42 m. sets 6 h. 28 m.
	—		☽ rises 11 h. 46 m. A.M. sets 3 h. 13 m. A. M.
	—		☽ pass mer. 7 h. 52 m.
	—		Clock before the ☉ 4 m. 35 s.
31	0	0	♃ in perihelio.

Eclipses of Jupiter's Satellites are not visible this month.

J. LEWTHWAITE Rotherhithe.

METEOROLOGICAL JOURNAL,

FOR JANUARY AND FEBRUARY, 1833.

1833.	Thermo.		Barometer.		Rain in inches.	1833.	Thermo.		Barometer.		Rain in inches.
	Hig.	Low	Hig.	Low			Hig.	Low	Hig.	Low.	
Jan.						Feb.					
26	41	27	30,08	30,01		11	53	40	29,33	29,24	,275
27	39	25	29,98	29,92		12	52	38	29,56	29,41	,225
28	44	31	29,87	29,75		13	49	39	29,30	29,24	,25
29	40	33	29,46	29,34	,05	14	48	38	29,21	29,14	,125
30	39	33	29,62	29,48	,075	15	44	32	29,29	29,06	,625
31	36	25	29,68	29,46	,125	16	43	28	29,41	29,31	
Feb.						17	45	29	29,66	29,51	
1	37	27	29,56	29,34	,05	18	48	34	29,56	29,46	,125
2	47	28	29,46	29,30	,35	19	47	35	29,81	29,72	
3	47	35	29,55	29,44	,2	20	43	33	29,49	29,13	,275
4	53	35	29,78	29,60	,05	21	47	35	29,77	39,64	,4
5	52	45	29,84	29,79	,025	22	45	39	29,94	29,81	,1
6	53	40	29,94	29,93		23	44	30	29,84	29,71	
7	53	40	29,82	29,72	,05	24	43	29	29,67	29,58	,05
8	52	41	29,71	Staty.		25	43	29	29,42	Staty.	,1
9	47	39	29,66	29,56	,5						
10	49	37	29,21	29,20	,275						

Edmonton.

CHARLES HENRY ADAMS.

Latitude 51° 37 32 N.
Longitude 3 51 West of Greenwich.

To GEORGE HENRY MANTON, *of Dover-street, Piccadilly, in the county of Middlesex, gun maker, for his invention of an improvement in the construction of locks for all kinds of fowling pieces and fire arms.*—[Sealed 2d September, 1829.]

THIS improvement applies solely to guns and pistols which are to be fired upon the detonating principle, the object being a means of allowing the fulminating powder to escape readily from the touch hole when exploding; as it has been found that by the employment of detonating primings, the force of the fulminating powder in the touch hole not being allowed to escape readily, has caused the piece to kick.

The Patentee proposes to remedy this inconvenience by opening the side of the touch hole at the same instant that the cock strikes the nipple, which will allow the fulminating powder to blow out.

Plate VI. figs. 12 and 13, show the side of a fowling piece, with a lock for firing by percussion; *a*, is the cock; *b*, the nipple upon which the detonating cap is to be placed; *c*, and *d*, is a double armed lever turning upon a pin in the bridge piece *e*.

A flat disc at the end *c*, of the lever, covers a lateral opening in the side of the touch hole, as seen at fig. 12, and thus keeps the touch hole closed and protected from the intrusion of wet to the priming. At the other end *d*, of the lever, there is a small friction roller, which bears against the edge of the cock, the lever being kept up to its bearing by a small spring.

On discharging the fowling piece, the descent of the cock forces the lever into the position shown at fig. 13, which shifts the disc *c*, from the aperture of the touch hole, and allows the ignited priming to blow away without causing the gun to recoil.

The Patentee says that the opening and closing of a lateral aperture from the touch hole may be effected in several other ways beside that which he has shown, and he therefore claims the exclusive right to every mode of letting off or relieving the exploded priming from the touch hole at the time that the piece is discharged.—[*Inrolled in the Inrolment Office, November*, 1829.]

To THOMAS ROBINSON WILLIAMS, *of Norfolk-street, Strand, in the county of Middlesex, Esq. for his having invented improvements in the making or manufacturing of felt, or a substance in the nature thereof, applicable to covering the bottoms of vessels, and other purposes.*—[Sealed 23d May, 1829.]

IN sheathing the bottoms of ships it was found desirable to place between the wood work and the copper plates, sheets of brown paper steeped in tar, for the purpose of protecting the wood work from the anger worm; latterly sheets of felted wool, steeped in tar, have been employed for the same purpose, and the object of this Patent is to prepare such sheets of felt by means of machinery.

Plate VI. fig. 14, represents the section of an apparatus to be employed for this purpose; *a*, is a vat or vessel containing tar; *b, b*, are two cylindrical rollers mounted in suitable bearings, over which rollers an endless web of wire gauze is passed. This web is conducted also over two guide rollers above the tar in the vat, and beneath a roller *d*, immersed in the tar; *c, c*, are two similar cylindrical rollers carrying another endless web of wire gauze, which passes under a weighted guide roller *e*, and also under the roller *d*, in the vat.

The loose wool which should be first prepared by carding, is to be spread out evenly of a sufficient thickness upon the inclined surface of the wire gauze, between the two front rollers *b*, and *c*, and the rollers being then made to revolve, the thickness of wool is drawn in by the two webs between the front rollers *b*, *c*, and is thence conducted down into the vat, where it becomes saturated with the tar, and being further carried between the two webs, it passes upwards beneath the pressing roller *e*, which gives it firmness, and is then led off and discharged from the webs in a stiff sheet on to the table *g*, where it may be cut into suitable sized pieces. After this the pieces are hung up to dry, and are then fit to be used for covering the bottoms of ships to protect the wood work.—[*Inrolled in the Inrolment Office, November*, 1829.]

To EDWARD HANCORNE, *of Skinner-street, in the city of London, nail manufacturer, in consequence of a communication made to him by a foreigner residing abroad, for an invention of certain improvements in making nails.*—[Sealed 16th October, 1828.]

THIS is a machine for manufacturing nails by cutting, pressing, and stamping rods, or slender bars of iron.

The rods or bars having been prepared either by rolling or hammering, or by cutting them from sheets or plates of iron, called slitting, are then to be made red hot, and in that state passed through the machine to be cut into suitable lengths,—pressed into wedge forms for pointing, and stamped at the end to produce the head. A longitudinal view of the machine is shown in Plate VII. at fig. 1; but, as it is very complicated in its details, and its principles appear to have been previously embodied in the machinery for making nails, patented by Mr. Thomas Tyndell, of Birmingham, in 1827 (see London Journal of Arts, Second Series, Vol. III. page 184), we do not consider it necessary to describe all its minutia, as the general operations of the machine may be very well understood from this figure.

A strong iron frame work, one side of which is shown at *a, a,* supports the whole of the mechanism; *b,* is a table capable of sliding to and fro. Upon this table lying horizontally are the clamps, which take hold of the sides of the rod as it advances, and also the shears which cut the rod into short lengths, suitable for making from each length a separate nail.

These clamps or holders consist of a fixed piece and a movable piece, the latter being brought into action by a lever. The shears or cutters are situate and perform much in the same way.

The rod or bar of iron shown at *c,* having been heated to a red heat, is passed into the machine by sliding it forward upon the table *b,* when the table is in its most advanced situation; rotary motion is then given to the crank shaft *d,* by means of a band passed round the rigger *e,* which causes the table *b,* to be drawn back by the crank rod *f*; and as the table recedes the horizontal lever is acted upon, which closes the clamps. By these means the clamps take fast hold of the sides of the heated rod and draw it forward, when the movable chap of the shears, also acted upon by a lever, slides laterally, and cuts off the end of the rod held by the clamps: the piece thus separated being intended to constitute one nail.

Let it be supposed that the nail situate at *g*, having been thus brought into the machine and cut off, is held between clamps, pressing it sideways, but which are not seen in the figure: in this situation it is about to be headed and pointed.—The header is a steel die *h*, intended to be pressed up against the end of the nail by a cam *i*, upon the crank shaft, which cam at this period of the operation acts against the end of a rod *k*, forming a continuation of the die *h*, and forces up the die so as to compress the solid metal into the form of a head.

The process of pointing the nail is performed by two rolling snail pieces *l*, *l*. These snail pieces are something broader than the width of the nail, and turn upon axles supported in the side framing. As the table *b*, advances, racks *m*, on the edge of the table take into toothed segments *n*, *n*, on the axles of the snails, and cause them to turn.

The snails at first pinch the nail close under its head with very little force, but as they turn over the longer radius of the snail coming into operation upon the nail, its substance is then very considerably pressed, and forced into a wedge form. This completes the nail, and it is immediately discharged from the clamps or holders; the carriage is then sent forward again by the rotation of the crank shaft, and another portion of the rod *c*, is brought forward, cut off, and formed to the desired shape of a nail, in the way above described.—[*Inrolled in the Inrolment Office, April,* 1829.]

To Edward Dakin Philp, *of Regent-street, Saint James's, in the city of Westminster, and county of Middlesex, chemist, for his having invented an improved distilling and rectifying apparatus.*—[Sealed 29th November, 1828.]

This is an apparatus to be placed upon a still head, for the purpose of separating the aqueous from the alcoholic vapours, which it professes to do with better effect than has been accomplished by any other contrivance heretofore employed.

Plate VII, fig. 2, exhibits the external appearance of the apparatus placed upon a still; fig. 3, shows its internal arrangement in section upon a larger scale; *a*, is the head of the still, from which a cylindrical tube *b*, *b*, *b*, rises as a head. This tube is divided into several compartments *c*, *c*, *c*, *c*, (four are proposed) by horizontal partitions *d*, *d*, *d*, *d*, *d*. All communications from one compartment to the next is cut off by these partitions, except through the apertures *e*, *e*, *e*, *e*, *e*, and these are guarded by water joints.

Within the compartments *c*, inner chambers are formed by inverted cylindrical boxes *f*, *f*, *f*, *f*, and the vapour emitted from the still, after entering the lower compartment *c*, passes from thence into the interior of the box *f*, by apertures at the lower parts of the inverted box, or the boxes may stand within the compartments upon legs, the object being to make the way free for the flow of the vapour from the lower part of each compartment into the inverted box within it.

Each compartment is circumscribed by a cylindrical vessel *g*, *g*, containing water for the purpose of refrigerating the vapour, and promoting its condensation, and the water is supplied to the upper vessel by a pipe *h*, from whence it flows into the lower vessels by other pipes *i*, *i*, *i*, and is discharged ultimately at *k*.

The construction of the apparatus having been described,we proceed to explain the mode of its operation:—The vapour rising from the still passes, through the lower aperture *e*, in the head *b*, into the lower compartment *c*, as shown by the arrows. In this compartment the vapour becomes partially cooled by the surrounding vessels of water, and its aqueous parts become condensed, which fall to the bottom of the compartment, and flow away into the still again by the descending pipe *l*, while the alcoholic vapour rises through the apertures *m*, *m*, at bottom into the box *f*, *f*, and thence proceeds from the box *f*, up the tube *e*, as shown by the arrows into the second compartment *c*. Then the vapour becomes again cooled by the surrounding vessel of cold water, and is further condensed, the aqueous part falling to the bottom of the compartment, and flowing away through the water joint to the lower compartment, and the alcoholic vapour rising as before through the aparture *e*, to the next compartment and so on, until it reaches the top of the still head, whence it proceeds in a highly rectified state by the pipe *n*, to the worm tub, or ultimate refrigerator, where the alcoholic vapour becomes condensed into a pure spirituous liquor.

The Patentee does not confine himself to any particular dimensions or number of compartments, boxes, and vessels *c*, *f*, and *g*, nor does he define the precise features of his invention, but states that he does not claim any of the parts of the apparatus which may have been so employed before.

After his indefinite claim, we feel ourselves bound to refer our readers to the patented inventions of Mr. Saintmare, applicable to distilling apparatus, (see the first Series of the London Journal of Arts Vol. X. page 77. and Vol. XIII. page 198,) in which the more perfect condensation of the vapour emitted from a still, is sought to be effected by passing it through a succession of chambers in connection with refrigerating liquor, until the vapour is discharged at top in a highly concentrated state; also, the flow of water through the surrounding vessels *g, g,* by which the coldest medium is applied to the most highly concentrated portions of the vapour, is an adaptation of the same principles as those claimed under Yandal's Patent, refrigeration, (see also Vol. XIII. page 95.)—[*Inrolled in the Inrolment Office, May,* 1829.]

To JOHN FORBES, *of Cheltenham, in the county of Gloucester, architect and surveyor, for his new invented method of burning or consuming smoke.*—[Sealed 15th December, 1828.

THE principle feature of this invention is placing one fire grate immediately under another, by which the smoke emitted from the lower fire will pass up through, and be consumed by the upper fire.

The object of the invention, we presume, is to cure smokey chimnies, but upon what principle the additional fire is to effect this, we do not perceive.

Plate VII, fig. 4, is a section of the fire place and chimneys; *a,* is the upper or ordinary grate; *b,* is the lower grate. The smoke and combustible vapours from the fire of the lower grate *b,* is intended to pass through the fire of the upper grate *a.* A blower *c,* is made to

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Mosley & Bell's, improved Pill Boxes.

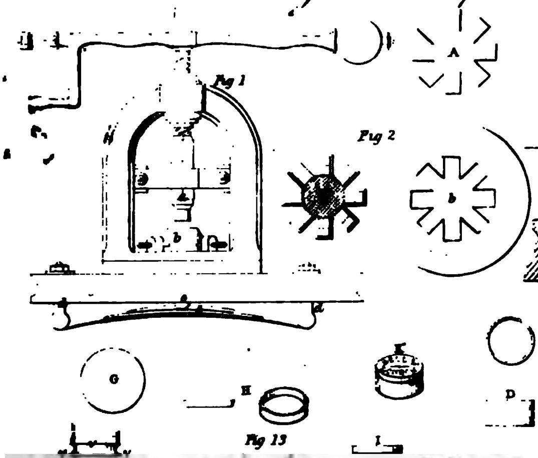


Fig 1 Fig 2 Fig 13

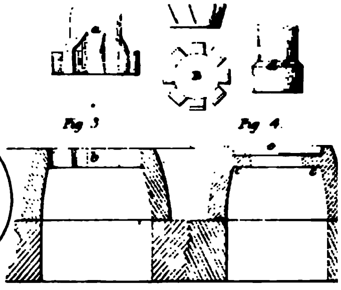


Fig 3 Fig 4

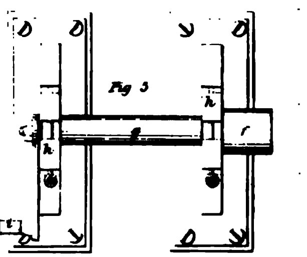


Fig 5

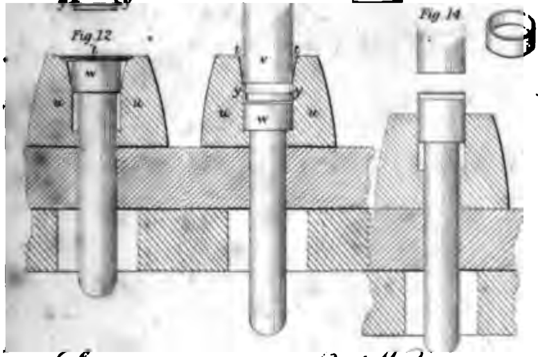


Fig 12 Fig 14

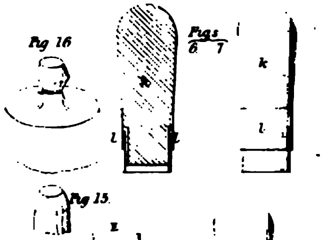


Fig 16 Figs 6 7 Fig 15

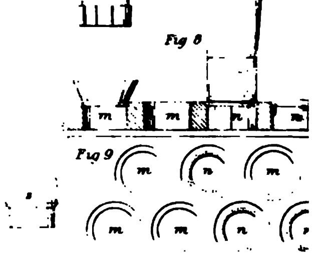


Fig 8 Fig 9

Scriveners, improved Rail Ways.

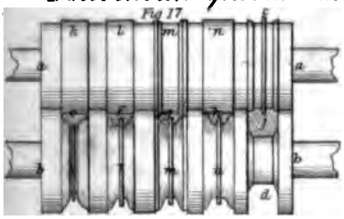


Fig 17

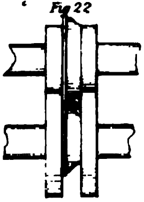


Fig 22

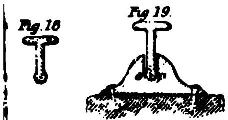
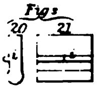


Fig 18 Fig 19


Figs 20 21

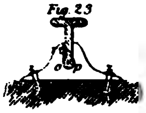


Fig 23

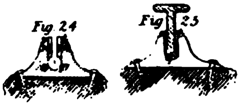


Fig 24 Fig 25

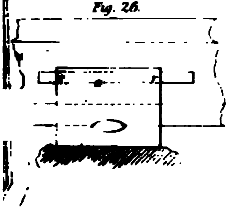


Fig. 26.

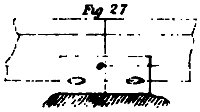


Fig 27

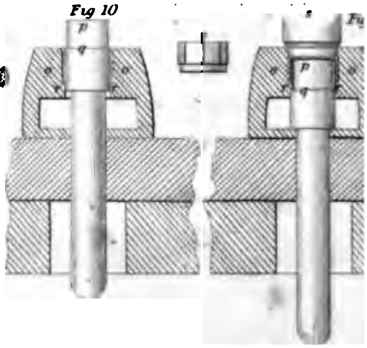


Fig 10

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Recent Patents.

* * *

To John Osborne Mosley *and* George Bell, *both of Primrose-hill, Salisbury-square, in the parish of Saint Brides, in the city of London, die-sinkers and embossers, copartners, for their invention or improvement in the making or manufacturing of pill or other boxes from pasteboard, paper, or other materials, which improvements are applicable to other purposes.*—[Sealed September 8th, 1832.]

These improvements in the making or manufacturing of pill and other boxes from pasteboard, paper, or other materials, consist in forming the boxes, and also their lids, by means of dies in cutting and stamping presses, by the employment of which presses and dies, pieces of cardboard, or thick paper, are first cut out to the desired shapes, and afterwards are bent up and pressed into the forms of boxes and lids of boxes.

The dies are of two kinds: first, the cutting dies for forming the pieces of card or paper of which the boxes are to be constructed; secondly, the stamping dies for shaping the pieces, and bringing them together into the proper forms.

The cutting dies must be made according to the shapes and dimensions of the intended boxes. Suppose a circular box is required to be made of about one inch in diameter, and five-eighths of an inch deep, we first cut out a piece of thick paper or card, the form of which may be described as an octagon, of about one inch and seven-eighths across, with acute notches cut out at its angles; from this piece the bottom and cylindrical part of the box is to be made, by placing it in a stamping press between suitable dies, and forcing up its edges first into a cup shape. A cylindrical hoop of thick paper or card of about three quarters of an inch wide, and of the same diameter as the interior of the intended box, is then provided, either by winding a strip of pasted paper round a stick, or by any other convenient means, which hoop is to be placed within the previously formed cup as a lining, and must be attached to it by paste, or other adhesive matter.

After this the cup and lining are placed in a stamping press between other dies, and being made to adhere firmly, form a cylindrical box with a ledge, against which the edge of the lid is to fit; thus producing the bottom and straight sides of the box in one piece. The lid of this box is to be made from a circular disc of thick paper or card, of about one inch and three-eighths diameter, which is to be in like manner pressed by dies, first into a dish form, and ultimately to a true cylindrical figure, fitting exactly on to the top of the box. The lid of the box being shallow, the angular notches are not required to be cut out of the disc of paper.

In varying the sizes of the boxes to be made by these means, the octagons and discs of paper or card must be varied, and also the dies employed for cutting and forming the boxes; the Patentees do not intend to confine themselves to any particular shapes or dimensions. For the purpose of rendering their improvements better understood, the Patentees have subjoined to their specification in a sheet of drawing representations, several figures of the parts of a box, cut out and detached, and also combined upon this principle; and likewise various views of the tools employed in their manufacture, which will also be found in the several figures in Plate VI.

Fig. 1, is a front elevation of an ordinary fly press, which is used for performing all the various operations of cutting and pressing in the different stages of this improved manufacture of pill and other boxes; *a*, is the part containing the upper die; *b*, is the bed containing the counter die, which in some instances is made moveable in the bed. And as it is necessary in some parts of the process to raise the counter die with the portion of the box under operation from out of the bed, after the stamping or pressing has been performed, a strong spring *c*, is attached under the press, and connected to the bench, upon which the press is fixed by screw staples *d*, *d*, which allow of the spring being adjusted. The centre part of this spring presses upwards against the tail piece or piston *e*, of a moveable counter die, and raises it after it has been depressed by the upper die; but the Patentees state that they do not mean or intend to confine themselves to the use of this spring, as a weighted lever or other construction of spring would answer the purpose equally well, and proceed to describe their invention as follows:—" In our improved manufacture of pill and other boxes, we employ a number or series of these kind of presses, placed on benches round the work-room, each press containing a pair of the proper shaped tools or dies to cut out and form the different parts of the boxes, and the presses are stationed in such order that the work performed by the first press may be handed to the next, and so on throughout the whole process of manufacture--thus keeping a very considerable number of boxes in progress at one time. But it will be evident that a machine or apparatus might be constructed which would perform all the various operations of our different presses, such machinery or apparatus being made to contain a number or series of the cutting and stamping dies, worked by levers or other means, and having a feeding apparatus to convey the material or parts of the box under operation from one pair of dies to the next, and so on. It is therefore to be understood, that the subject of our invention, or that which we claim as new in the manufacture of pill and other boxes, is the process of making them from sheets of cardboard, thick paper, or other materials, by means of cutting, pressing, or stamping dies, as described, without reference to any particular construction of machinery by which the said dies may be put into operation.

" The shape of the piece of cardboard or paper, used in the first instance, to form the bottom and sides of the box, as described, is represented in the accompanying drawing at A.

" These shapes or pieces are cut out of a flat sheet of card board or paper by the pair of dies *a*, and *b*, shown in plan views at fig. 2; *a*, is the upper or cutting die, and *b*, the counter die or bed. The sheet of cardboard or paper is placed between them, as shown in fig. 3, in which *b*, is a vertical section, taken through the middle of the counter die or bed, with the sheet of cardboard or paper lying upon it, and above it is the cutting die. The upper die or cutter *a*, descends by the ordinary action of the press, and after punching or cutting out each shape or piece of cardboard or paper A, forces it down through the counter die *b*, and it falls into a box or receptacle below.

"These pieces A, are then forwarded to the second press, where they are severally brought into the cup shape, shown in plan and side representations at B; this is effected by the punch and counter die, shown at fig. 4, which is a section of the counter die and bed *c*, the punch *d*, being placed over it. The shapes or pieces A, are severally placed in the circular recess *e*, *e*, in the counter die or bed, (as shown at fig. 4,) and on the descent of the punch *d*, the piece A, will be passed through the counter die *c*, and its edges bent up into the shape B. The box being intended to have a shoulder for the edge of the lid to fit against, there must be a lining placed within it as described, the lid being made to fit upon the lining so that the edges of the piece B, may form the ledge.

"This lining may be produced by taking a long strip of pasted paper, as shown at C, and winding it round a stick or roller. Fig. 5, is a plan view of a small apparatus used to form the lining. The roller *f*, is placed upon the end of the shaft *g*, turning in bearings in the standards *h*, *h*, and has a small winch handle *i*, on its reverse end, by which it is turned round, and the strip of paper being wound upon it, a cylindrical hoop is produced, as shown in several views at D. But these cylindrical hoops or linings may be made by other means; for instance, a long cylindrical tube of the proper diameter may be formed out of paper or cardboard, and the linings cut off from this tube to the required length.

"The paper hoops D, after being dried, are put upon the end of the tool or handle *k*, fig. 6, to be pasted, part of the hoop being shielded or covered by the guard-ring *l*, as shown more evidently in the section of the tool fig. 7. Paste, or other adhesive matter, being now put upon the outside of the hoop in order to stick it to the interior of the box, it is in that state placed within one of the pieces B, which has been previously placed over one of the holes *m*, made in the drying board, particularly shown at fig. 8, and in section at fig. 9. These holes *m*, in the drying board are bevelled, or made conical upon the upper edge; and on pressing the tool *k*, with the hoop D, and part B, downwards, the inclined sides of the holes in the board will close the sides of the piece B, and the lining D, and confine them in the drying board, as shown in fig. 9, and on drawing out the tool *k*, they will be left in the board, as represented at *n*, *n*, in figs. 8 and 9, where they will remain until they are dry enough for the next operation, and will be of the shape represented in the side view E, which may now be called a box, though not finished.

"The next operation to be effected, is that of finishing the shape of the box, and pressing the top edge of the lining and the ledge parallel with the bottom of the box at the same time, to emboss the name of the maker, or any device upon the bottom.

"This is effected by the punch and counter die, shown at figs. 10 and 11, in which the bed *o*, is shown in section, and the pair of dies as seen on their sides. The upper part of the counter die exactly fits the interior of the box, the edge of the lining resting upon its ledge *q*, *q*. There is also a ledge *r*, *r*, within the bed, against which the ledge of the box is pressed by the upper die *s*. This die may have upon it any device desired to be embossed upon the bottom of the box; the outside diameter of the box exactly fits the inside of the bed. The counter die *p*, being raised out of the bed *o*, as shown in fig. 11, by the spring or other means, one of the boxes E, is placed bottom upwards upon it, the edge of the lining resting upon the ledge *q*; the upper die then descends, and forces down the counter die until the ledge of the box meets the ledge *r*, *r*, within the bed, when a sufficient pressure is given to emboss the name or device upon the bottom of the box, and form it truly cylindrical and perfect, as represented in a side view at F. The box will then be ready to be covered with any coloured paper or outer covering, by hand if desired.

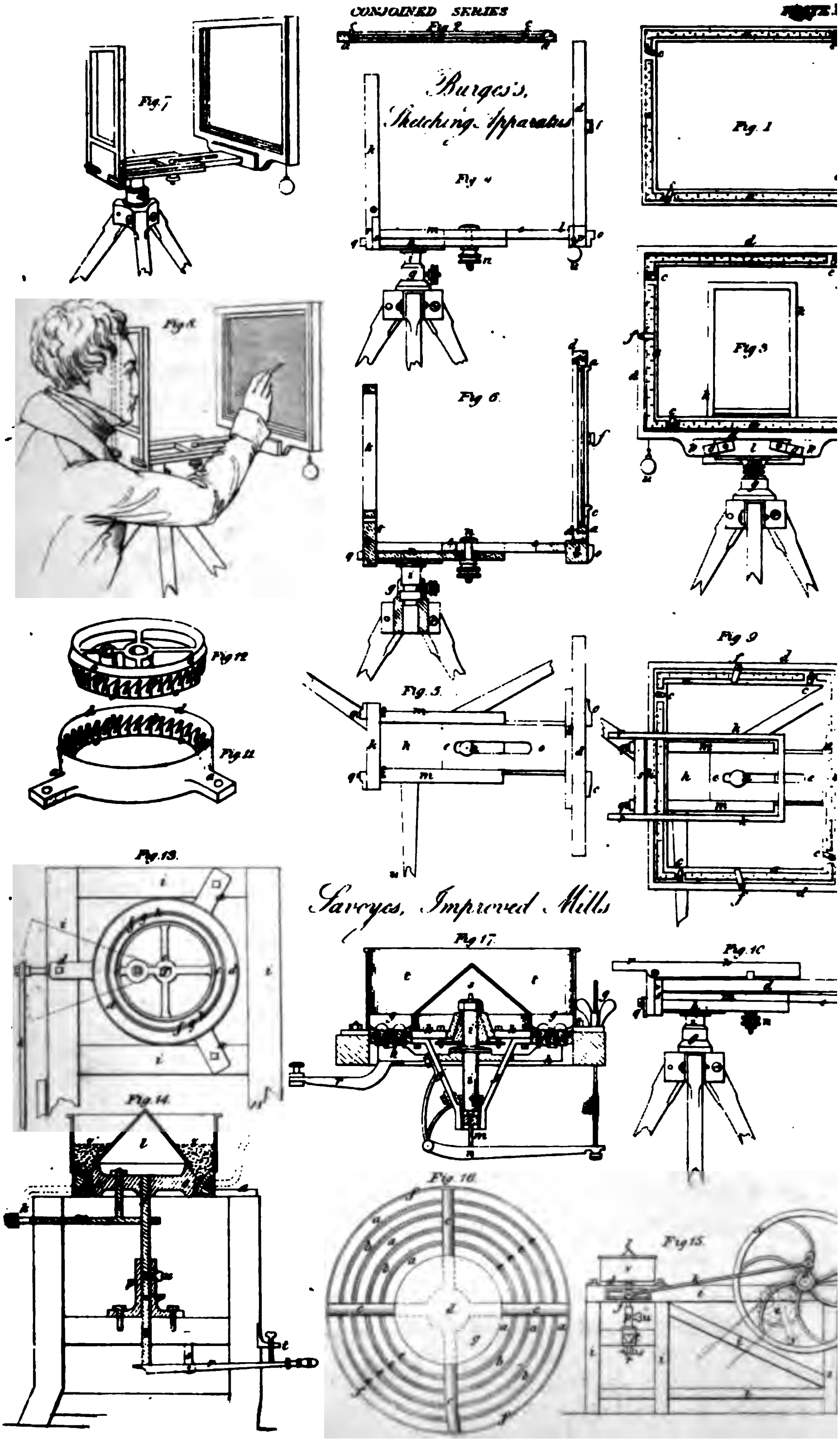
" The piece of paper or cardboard used to form the lid of the box is a perfect disc, as shown at G, and may be cut out of the sheet by a common hollow punch, or a solid punch and hollow counter die. The latter we prefer, as it forms a more perfect edge to the disc.

" The pieces G, are placed into the circular recess *t*, of the bed *u*, (see figs. 12 and 13), which are section figures taken through the bed, but showing the upper die *v*, and counter die *w*, as seen on their sides. Fig. 12, shows the dies apart, and the dise of paper or cardboard placed in the countersunk recess in the bed. On the die *v*, descending, the disc is held fast between the dies, and as they continue to descend, the inclined or conical part *x*, of the bed, causes the edges of the disc to be turned up, and come in contact with the lower part of the upper die, which is just as much smaller than the lower or cylindrical part of the bed as the cardboard or paper is thick. There is a small cutting edge at ledge *y*, *y*, upon the upper die, which, when it comes in contact with the cylindrical part of the bed, cuts off any little superfluous matter from the disc, should it happen that it has not been placed in the recess quite central with the dies. The dies descend with the lid of the box until the shoulder or bottom of the counter die comes against the bottom of the cylindrical part of the bed, as shown in fig. 13, when the box lid receives sufficient pressure to cause it to retain its proper cup shape, as represented in the different views at H. The counter die being raised up out of the bed, the piece H, is removed and forwarded to another pair of dies, where it receives its last compression, and if required, the name of the chemist who uses the pill boxes, or any other device may be embossed upon it. Fig. 14 shows a pair of dies and bed, the counter die having a smaller diameter fitting the interior of the box lid; the upper die carrying the device to be embossed upon the top of the lid. The cup shaped piece H, or lid, is placed upon the smaller diameter of the counter die, and on the upper die descending, the counter die and the lid are forced down into the cylindrical part of the bed, and there receive sufficient pressure to form them perfectly cylindrical, and cause them to retain their proper shape, as shown at I, when they will be ready to have a slip of coloured paper pasted round it to match the box, as shown at K, which is a perspective representation of one of our improved pill boxes when finished.

"When pill boxes are not required to have a shoulder for the lid to fit against, then the lining, if used at all, need not extend above the top of the box, the side of the box being made somewhat deeper; in this case the ledge *q*, of the counter die *p*, (see figs. 10 and 11,) may be dispensed with; but the lining in some cases may not be thought necessary, as the outside covering may be found sufficient to strengthen the sides of the box; and under these circumstances we prefer making the outside covering in a cylindrical hoop, formed in the same manner as the linings

Burges's, Sketching Apparatus

Savoye's, Improved Mills



April. 1833

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above described, the piece B, being placed withinside of the hoop instead of the outside.

"Having now particularly described and ascertained the nature of our improvements in the manufacture of pill and other boxes, it only remains for us to state, that the same improvements are applicable to the process or manufacture of various other useful articles; for instance, we make or construct caps or coverings for vials, or other bottles, by the same description of cutting and pressing dies, and emboss the name of the chemist or perfumer (who uses such bottles) upon the top part of the cap. Fig. 15, is a perspective representation of one of these improved coverings or caps, and fig. 16, is a representation of a part of a vial with one of them affixed."—[*Inrolled in the Rolls Chapel Office, March*, 1833.]

Specification drawn by Messrs. Newton and Berry.

To CLAUDE MARIE SAVOYE, *of Oxford-street, in the county of Middlesex, merchant, in consequence of a communication from a foreigner residing abroad, for an improvement or improvements in mills or machines for grinding or reducing grain and other substances* — [Sealed 15th December, 1831.]

THESE improvements in mills or machines for grinding or reducing grain and other substances consist, first, in a peculiar modification of the parts which constitute the rubbing or grinding surfaces; secondly, in giving to the said rubbing or grinding surfaces an alternating circular motion; thirdly, in surrounding the said mills or machines with water or other fluid at a low temperature, to abstract and carry off the heat generated by the friction of the machinery, and the substances operated upon.

Having thus stated in what the aforesaid improvements consist, the Patentee proceeds particularly to describe and ascertain in what manner the same are to be performed in the following manner, reference being had to the several figures of this invention in Plate VII. The invention in its simplest form consists of two principal parts, as delineated in perspective by figures 11 and 12. Fig. 11, is a circular piece or ring of cast iron or other suitable material, which is made fast in a horizontal position to a strong frame of wood or metal, by means of ears or lugs, two of which are brought into view at *a*, *a*. The exterior side of this ring is perpendicular, but the interior is inclined or sloping, where it is furnished with a series of inclined teeth *b*, *b* ; these teeth project beyond the smooth surface about a twelfth of an inch at their upper ends, but gradually diminish in their projections or thickness downwards, until they arrive at the smooth surface (or as workmen express themselves, terminate at nothing), but just previous to their arrival at this point they are met by a series of small grooves or gutters *c*, *c*, which are intended for the passage of the bran or other parts of the ground materials, as well as to permit the transmission of currents of air through them.

Fig. 12, represents a perspective view of the inner ring or moving wheel, made of similar materials to fig. 11, and provided externally with a circle of similarly formed teeth, (marked also *b*, *b*, and *c*, *c*,) except that they are inclined in the reverse direction, for the purpose of producing, by their opposite position, a clipping or scissors like action. This inner ring is also made a little inclined or conical externally, so as to fit concentrically within the circle of fig. 11, and bring their respective teeth either to touch or approach each other at uniform distances apart throughout the circle or annular space formed between them.

For the clearer explanation of this arrangement, a plan of the two toothed rings (delineated at figs. 11 and 12,) is given by fig. 13, in which the parts are reduced, *d, d*, representing the outer ring, and *e, e, e*, the inner ring; between these are represented three concentric circular lines, respectively marked *f, g, h*; the space from *f*, to *g*, denotes the thickness of the upper extremities of the teeth of the outer toothed ring, and the space from *g*, to *h*, the thickness of the upper extremities of the teeth of the outer ring, while the breadth of the middle line *g*, may be considered to indicate the space through which the flour or reduced substances pass out of the mill. In this figure the ears or lugs *a, a, a*, are shown, with holes made through them, for the purpose of fastening them by screw bolts to the framing *i, i, i*; *j*, is a central spindle fixed to the inner ring *e*, upon which it turns. The motion imparted to this wheel is nor rotative, but alternating through only a portion of its circumference, by the action of a vibrating rod *k*, which will be better explained in connexion with the figures hereinafter described.

Fig. 14, exhibits a vertical section of the principal parts of the mill; *a*, shows one of the lugs or ears; *d, d*, the outer toothed circle; *e, e*, the inner, and between them on either side, the three lines diverging to a point, represent the teeth. The interior circle *e*, is covered with a conical cap of sheet iron *l*, and the outer circle *d*, by a cylindrical open topped hopper *v*, the space between this hopper and that cap being appropriated to the reception of the corn or other substances to be ground. The alternating motion given to the inner toothed circle *e*, is thus effected; a lever *m, n*, is fastened by a nut and screw to one of the arms of the inner wheel *e*, and also to the axis *j*, which constitutes the fulcrum of the lever. The other end of this lever passes through the framing, and is attached to the extremity of the rod *k*, which is made to vibrate by the revolution of a crank *o*, actuated by any convenient power, as shown in fig. 15.

As the weight of the inner circle *e*, would cause it to come in contact, and press upon the outer, if unsupported by other means, the following arrangement is adopted, by which it is supported, and the required space between the grinding surfaces is at the same time adjusted. The spindle *j*, turns in a socket *p*, fixed to the framing, its extremity resting on a bolt *q*, that passes loosely through a hole in the framing, and the end of the bolt is supported upon the extremity of a lever *r*, which has its fulcrum at *s*, and is acted upon at *t*, by a screw as represented, the turning of which screw causes the inner grinding circle *e*, to be elevated or depressed, and thereby removed farther from or nearer to, the outer grinding circle, thus adopting them to grind coarse or fine at pleasure. When the material to be ground is so hard as to create such a resistance to the action of the mill as to cause the inner ring *e*, to rise up, and thereby allow the materials to pass unground, or insufficiently reduced out of the mill, a screw stop, represented at *u*, is put into requisition; this screw stop passes through a tap in the socket *p*, and enters a groove formed in the spindle *j*, thereby preventing the spindle and the circle *e*, from rising up beyond its assigned limits, which may be easily adjusted by such obvious adaptations as not to need particularising.

"Having described the separate parts and uses of the aforesaid machine, the Patentee proceeds to describe its action generally with reference to fig. 15, which on a still farther reduced scale exhibits a side elevation of the whole machine;

w, is a winch, which being fixed on the axis of the fly wheel *x*, and the crank *o*, communicates motion to them, and through the medium of the latter actuates the vibrating rod *k*, producing the alternating motion of the lever, as before described. In the figures already referred to is represented a mill of only ten or twelve inches in diameter in the grinding surfaces, which, requiring but little force, a quick motion is easily given without increasing the velocity of gear. But when it is desired to employ the entire strength of a man, a mill of from fifteen to eighteen inches in diameter is preferable; in which case the operator will work to more advantage by employing a slower first motion, and obtaining the required velocity of the mill by means of gear, as shown by the dotted parts in fig. 15, the power being applied to the handle *y*, on the axis of which is a toothed wheel *z*, that takes into a pinion of half its diameter on the axis of the fly wheel. The number of vibrations or alternations of the mill may vary from sixty to one hundred in a minute, without materially affecting the result, but my experience has led me to give the preference to about eighty vibrations per minute.

"The principal inconvenience that would be produced by too rapid vibrations, is the heating of the flour or other materials; and to prevent this effect, I cause a stream of water to pass through an annular cavity made in the outer or fixed grinding circle. The water enters by a pipe on one side of the circle, and is carried off by another pipe on the opposite side of the circle; each of the pipes may be furnished with stop cocks, to regulate the admission and emission of the fluid.

"This arrangement is represented by the dotted parts of fig. 14, and have not been drawn in full lines, as it will rarely be desirable to pass water through mills of such small dimensions, yet it equally serves to explain the principle of the improvement when applied to those of larger dimensions. Instead of a cock on each of the pipes before mentioned, one will do on the pipe of discharge, only which being partially closed, would detain the water in the annulas sufficiently long to abstract the heat from the metal. There are however various ways of effecting this object of cooling mills, by a stream of water passing through or around them, and as the invention consists in the application of water to mills of metal, or alloys of metal, it would be needless to describe them more at length, as workmen of ordinary skill are competent to carry the application into practice, according to the circumstances of the case.

"Having completed the description of one of the said patent mills of the simplest kind, I proceed to explain another of a more complex structure, although it consists of an extension of the same principle as the former. That which I have already described consisted of only two concentric grinding parts, but the improvement I have now to explain consists in the adaptation of any convenient greater number than two grinding parts, so as to obtain greater efficiency in a more compact and less expensive form than have heretofore been constructed. An arrangement on this principle is illustrated by figure 16, which shows a combination of five grinding rings, the three marked *a, a, a,* being fixed to the bed or frame of the mill, and the two marked *b, b,* which fit concentrically inside of *a, a, a,* are put into motion (of the alternating kind as before mentioned) against them. For this purpose the two rings *b, b,* are firmly connected to the bars *c, c, c,* which radiate from a vertical axis or spindle at *d,* that communicates the alternating motion from a vibrating lever moved by any convenient means. Another modification of a compound mill of a similar description to the last mentioned, is given more in detail by the sectional fig. 17 where *e, e, e*, represent three grinding rings concentrically place around two other grinding rings *f, f*, the former being fixed to four radial equidistant arms *g, g*, and the latter connected to four other radial equidistant cross bars *h, h*, fixed to and moving with their vertical axis I. This axis has a sliding motion up and down, causing the circles *f, f*, to approach to or recede from the circles *e, e, e*; it is supported laterally at one extremity by a central boss, which is suspended by four inclined bars *j, j*, that are bolted to an horizontal cross frame above *k, k*, which has also a central boss that embraces the upper end of the axis, where the latter is provided with brasses to reduce the friction, as well as at the lower extremity, as shown in the drawing. The toe of the axis is made spherical, and turns on the concave surface of a piece of steel *l*, which is supported by a pin *m*, and a lever *n*; this lever having its fulcrum at *o*, and power being applied to the rod *p*, by turning the screw *q*, the axis is raised or depressed through the medium of *m*, and *l*. At *r*, is a curved lever bolted to the moveable circles, for connecting it to the vibrating motion; *s*, represents the concical hopper, and *t*, the cylindrical hopper (as in the before described mill), between which the substances to be ground are deposited.

"In applying water to these compound mills, it may be conducted by any of the known modes practised by workmen into hollow annular spaces formed within the fixed circles, and afterwards conducted off to a lower level, although the cooling of these fixed rings by currents of water or other fluid passing through them, will tend materially to reduce the temperature of the intermediate rings; water may be passed through the latter also; it may be introduced from above the mill, through a hollow vertical axis, and distributed thence by the radial connecting arms into the rings, whence by another passage it may be carried off through the lower portion of the said hollow axis. A similar mode may be adopted of conducting water through the inner ring of the first described mill, but I consider that to be unnecessary, except in large mills moved at great speeds, and that the application of water to the outer ring of a single mill (as that first described), or to the intermediate or alternate rings of mills containing a greater number of concentric circles than two, (as in the quadruple mill last described,) will in most cases be found sufficiently efficacious. It will be observed that the teeth or notches on the surfaces of the mill described are inclined; the consequence of which is, that the grinding is not equally effective in the two reverse motions of the mill. To equalize the grinding effect in both directions, I give the preference to upright teeth instead of inclined. The power required to work mills with upright teeth must of course be augmented, but the effect is greater in proportion, and the resistance as well as the power is more uniform.

" In the description I have now given of the several improvements which form the subject of my patent, I have necessarily included parts which are not new, and some parts that may be of doubtful originality; I therefore desire it to be understood that I limit my claims of patent right to the following improvements:—I claim, first, the alternating circular motion by whatever mechanical combination it may be produced, not only to the mills described, but to all other mills susceptible of its application; secondly, I claim the forming of compound mills by the concentric combination of a greater number of grinding circles than two, and the driving or actuating of these mills not only by *alternating*, but also by *continuous*, circular, or rotatory motion by any of the various modes known to mechanics; and, thirdly, I claim the introduction and passage of water or other fluid employed as a cooling medium, into and through, not only the mills before described, but the application of the same principle (modified according to circumstances) to all other kinds of mills made of metal."—[*Inrolled in the Inrolment Office, June*, 1832.]

To Caroline Eliza Ann Burgess, *of Beauport, in the parish of Hollington, in the county of Sussex, spinster, for her invention of an improved apparatus for sketching, drawing, or delineating.*—[Sealed September 8th, 1832.]

This invention of an improved apparatus for sketching, drawing or delineating consists of a frame or frames to be placed upon any convenient standard, for the purpose of holding a diaphaneous medium, upon which the outline of any figure or object seen within the area of the medium may be accurately and readily traced, sketched, or delineated by the hand of the observer.

The diaphaneous medium to be used in this improved apparatus consists, in the first place, of thin muslin or gauze, or such other description of fabric of a fine texture stretched over a transparent plate of glass, which muslin or other fabric is to constitute the diaphaneous medium intended to receive the outline of the picture to be traced upon it by a common black lead or chalk pencil. Or the transparent glass may be employed as the medium to be sketched upon by using a prepared pencil made of certain combinations of materials, by which the outlines of figures, or perspective views may be readily delineated upon the smooth glass without the intervention of the muslin or gauze. These sketches or outlines of any subject produced either upon the muslin or gauze, or upon the glass, may afterwards be traced or transferred to the paper or other material, upon which the finished picture is to be drawn in the following manner. After the outline or sketch of the picture has been delineated upon the muslin or gauze by a common black lead or chalk pencil, the muslin or gauze is to be stretched over the paper or other materials, on which the perfect drawing is to be made upon a table or drawing board, and the lines retraced or marked over again with a black lead or chalk pencil; the artist at the same time giving the hand a slight tremulous motion, which will cause the pencil to mark through the meshes of the fabric, and draw the outlines upon the paper. When the sketch is made upon the smooth glass by the prepared pencil, which marks thereon in opaque lines, the paper to receive the picture must then be held in contact with the glass, having a light behind it as a transparency, so that the artist may trace upon the paper over the opaque lines with a common black lead pencil, and thus obtain the outlines of the picture upon the paper. By the employment of the mediums of gauze or muslin a great many sketches may be made, and carried in a compressed form.

In Plate VII, are represented in several figures this improved apparatus, which will fully illustrate the invention. Fig 1, is a front view of a frame intended to hold the glass and diaphaneous medium to be sketched or drawn upon this frame is made separate from the apparatus, and can be removed out of it for the purpose of applying the muslin and glass to it, or for retracing the outline or sketch. Fig. 2, is a section taken through the frame, showing its rebates, and the manner of securing the glass and distended muslin. Fig. 3, is a front view of the apparatus complete, mounted upon its standard; fig. 4, is a side elevation of the same; fig. 5. is a plan view; and fig. 6, is a vertical section taken longitudinally through the middle; fig. 7, is the complete apparatus shown in perspective; *a, a*, is the frame holding the muslin and glass *b*, which is secured in the frame by buttons *c, c*.

On the face of the frame are placed a number of small metal pins or points standing outward, and on applying the muslin or gauze, it should be slightly stretched over the frame, when the metal points will catch hold of the muslin; and on the glass being pressed down into the frame, as shown in fig. 2, the muslin will become stretched tight over its surface, and may be secured in that position by the buttons *c, c*.

The frame *a*, with the glass and muslin, is then put into the second frame *d*, fixed to the sliding piece of the table *e*, and secured therein by the buttons *f, f*, when the instrument will be ready for use. The apparatus shown in the drawings is represented as mounted upon three legs, jointed to a socket piece *g*, but it may have any other kind of support desired; *h*, is a table having a pin *i*, attached to its under side, which fits into the socket piece *g*, and is secured by a thumb screw. This connexion allows the instrument to be turned round horizontally to face the object desired to be sketched, and when adjusted, it can be fixed by the thumb screw.

In sketching with this apparatus, it is necessary that the head of the artist should be kept steady, and in one position, during the time he is drawing; for this purpose a head rest *k*, is placed opposite the frame containing the glass and muslin, which is shown affixed to the end of the table *h*.

The frame *d*, is attached to a cross piece *l*, on the end of the sliding part *e*, of the table, which moves between dove-tailed guides *m, m*, and allows of an adjustment between the head rest and the diaphaneous medium, and when adjusted to the desired distance, is secured by a screw and pin *n*, passed through a groove in the sliding piece of the table. Fig. 8, is a perspective representation of the complete instrument, showing the position of the artist when sketching, that is, with his face placed in the head rest. If it should be thought desirable, an eye piece may be connected by an adjusting arm to the head-rest, but this is not thought necessary, except for very particular purposes. If the artist leaves off sketching before the outlines of the picture are completed, care should be taken on again commencing, to put the head in the same position as before, so that the lines already sketched may cover those of the object. The pencil for sketching upon the smooth glass may be composed of any compound or ingredient which will mark an opaque line upon glass; those which the Patentee uses for this purpose are composed of the following materials, although the Patentee does not intend to confine herself to that precise compound. For H. H. pencils is used a compound of two pounds of gum shelac, four pounds of best curd soap, one pound of best spermaceti, a quarter of a pound of gum mastic, two ounces of gambouge, half a pound of vegetable black; the whole well mixed properly together over a slow fire, and the composition run into grooves in wood in the same way as common composition black lead pencils are made. In order that the instrument may be more portable, the head-rest *k*, and the frame *d*, are mounted upon the table with hinge joints, to allow of their being turned or folded down, as shown in figs. 9 and 10, which are a plan and a side view of the apparatus in that position. When the frame *d*, is in an upright position, it is kept steady by buttons which confine the tail pieces *p*, *p*, of the frame *d*, against a part of the cross piece *l*; *q*, *q*, are buttons which keep the head-rest steady when in use, by pressing the tail pieces *r*, *r*, against a part of the cross piece *s*, fixed on to the other end of the table; *t*, *t*, are small studs or pins which fit into holes in the top of the frame *d*, when it is turned down and pushed up against the cross piece *s*, as represented in figs. 9 and 10, and by screwing the pin *m*, tight, the frame *d*, will be fastened down; *u*, is a small weight or plummet suspended from the top of the frame *d*, by a slight cord, by which the artist can adjust the frame containing the diaphaneous medium to a horizontal and perpendicular position.

The Patentee states in conclusion, " although I have herein showed and described an apparatus for sketching and drawing, which I consider as convenient and portable, I do not mean or intend to confine myself to that particular form of apparatus, as it may be made simply with the table, head-rest, and frame, without either hinge joints or adjustment; and also the manner of supporting the apparatus when in use may be varied to suit convenience, as it may be used standing upon a table, or fixed upon the back of a chair, or upon a gate, by means of a screw clamp connected to the table *h*; and I therefore wish it to be understood that I claim as my invention under the above in part recited Letters Patent, the application and use of muslin, gauze, or gauze lisse, or such other thin fabric of a fine texture as a diaphaneous medium to be sketched or drawn upon with a black lead, chalk, or other pencil; and also the application and use of transparent glass as the medium upon which sketches or drawings may be made by a prepared pencil, which will mark opaque lines readily upon the smooth surface of the glass.—[*Inrolled in the Rolls Chapel Office, March,* 1833.]

Specification drawn by Messrs. Newton and Berry.

To JAMES MACDONALD, *of the University Club-ho Pall Mall East, in the county of Middlesex, g tleman, in consequence of a communication made him by a certain foreigner residing abroad, for invention of an improved construction of railways.* [Sealed June 29th, 1832.]

THIS invention of an improved construction of railw consists in a peculiar mode of arranging and combin bars, rails, or ribs of metal, so that the several bars, ra or ribs, shall respectively sustain or support the press and tension of each other, and which combination applied to the construction of roads or ways for the pass of train waggons and other carriages. This peculiar rangement of bars, rails, or ribs, constitute when combi in certain lengths, a succession of very flat arches or s ments of polygons, which will not require the lateral s port of abutments, as they bear perpendicularly upon th piers placed at proper distances. The leading feature this invention may be perceived by reference to the raf tiebeam, and king post of an ordinary roof; the struct of the improved road or way being a succession and co bination of rafters, tiebeams, and king posts connected transverse bolts. In order to render this more evide we have exhibited in Plate VIII, at fig. 1. a pair of raft *a, a* connected by a tiebeam *b*, with a perpendicular k post *c*. Fig. 2, shows three several pairs of these raft with their king posts, and a continuous tiebeam connec by transverse bolts at *z, z, z, z*. Fig. 3, exhibits same combination further strengthened by longitudi bars *d, d*, which are also secured by transverse bolts at points of intersection. Fig. 4, shows a second series smaller rafters *e, e, e, e*, and king posts *f, f, f*, erec

PLATE VIII.

Fig. 5

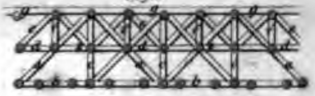
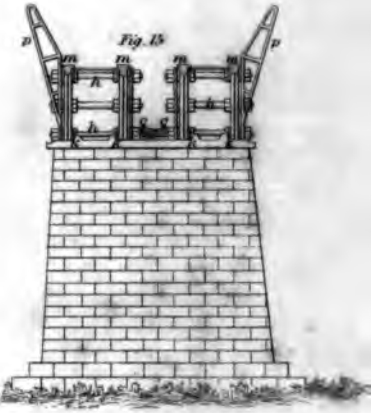
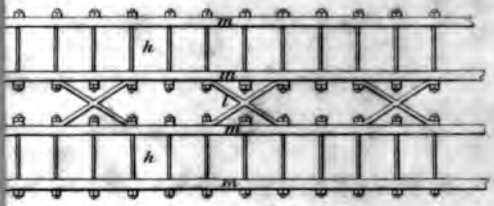
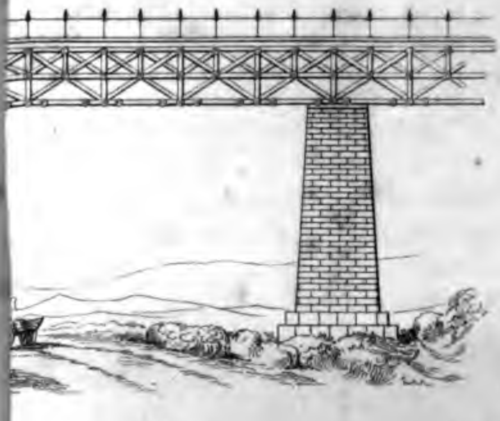


Fig. 15







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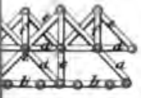


Fig. 5

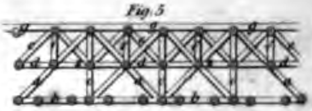
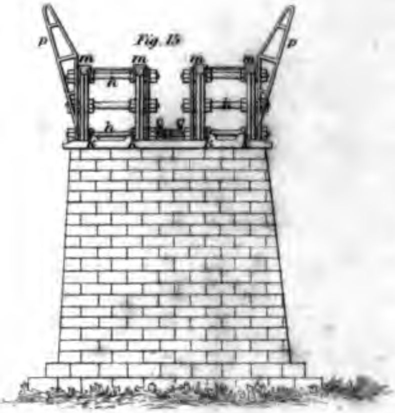
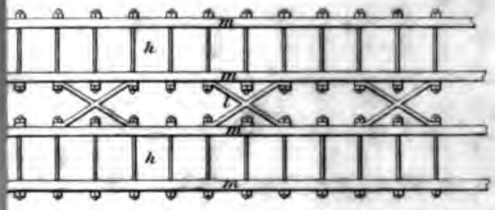
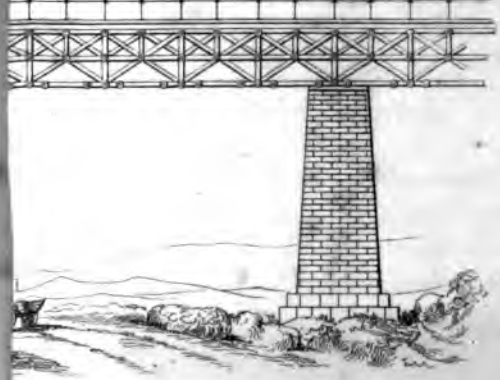


Fig. 15







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upon the bars *d, d,* as their continuous tiebeams; and fig. 5, is the same as the last figures, with the addition of a top rail *g, g, g,* which likewise is secured by bolts passed through the upper parts of the series of rafters and king posts.

Having thus explained the principle upon which strength and stability is obtained, suited to the construction of a railway erected upon columns, piers, or sleepers, at any height from the ground, by arranging and combining diagonal, horizontal, and perpendicular bars, rails, or ribs of metal, so as to produce nearly an equal tension and pressure of the parts, the Patentee proceeds to show the manner in which he proposes to form and connect the several pieces.

Fig 6, is a side view of one of the diagonal pieces or rafters *a, a,* drawn upon a larger scale; fig. 7, is a similar view of one of the perpendicular pieces or king posts *c, c*; these pieces are formed of bar iron, with holes in them at proper places, for the ends of the transverse bolts to pass through; fig. 8, shows the perpendicular piece *c,* connected to a part of the continuous tiebeam *b, b*; this continuous tiebeam is a chain formed of flat links of iron, having holes at proper places for the bolts or pins to pass through; fig. 9, is a plan view of a portion of this chain or tiebeam; and fig. 10, is a side view of the same; fig. 11, is a plan, and fig. 12, a side view of a part of the longitudinal bars *d, d*: these bars are also flat links, and when placed in connexion with the other parts of the railway, as shown in figs. 3, 4, and 5, form a continuous chain. Fig. 13, is a side view of a portion of the top rail *g, g,* two of which are applied to each range of bars, rails, or ribs, to give additional strength. Fig. 14, is a representation of one of the transverse bolts or stretches *h,* the ends of which are passed through the holes pierced in the several bars, rails, or ribs, and the whole is secured together by screw nuts, as shown in fig. 15, which is a transverse section taken through the complete railway, showing the structure resting upon its sleeper or plate of cast iron *i*, *i*, placed upon the pier, and also the manner of keeping the parallel ranges of bars, rails, or ribs, secure from lateral disarrangement by the ears or lugs *k*, *k*. Fig. 16, is another section, showing the railway as placed upon pillars or columns; fig. 17, is an elevation of a portion of a complete railway, in which is seen bearing at three points upon a sleeper, a column, and a pier; fig. 18, is a plan view of the same.

The Patentee then proceeds to state "Having now described the method of arranging and putting together the parts of the railway, it is necessary for me to state that in forming a railway on this improved plan, I should prefer constructing it in lengths or segments of from forty to fifty feet, the ends of such lengths or segments bearing upon the piers, pillars, or sleepers, and that I prefer using four parallel ranges or series of bars, rails, or ribs, arranged in pairs, and connected together by cross pieces or stretchers *l*, *l*, as shown in the sectional figures 15 and 16, and seen also in the horizontal or plan view of the continuous railway, fig. 18.

Each length of these ranges or series of bars, rails, or ribs, when put together, should form a very flat curve, which need not spring more than about one inch from the chord line in the lengths of fifty feet, and consequently all the upright pieces *c*, *c*, or king posts, should be in the proportion of radii from the centre of the circle of which such spring of the curve would form a segment, and hence the length or distance between the upper ends of the king posts or pieces *c*, *c*, would be something greater than the length or distance between their lower ends; but such difference would be very trifling in the erection itself, and the spring of the curve of each length or segment being too small to be rendered evident in the figures.

The extremities of the separate lengths or segments of the way extending from one support to the next, are connected together over the centres of the bearings upon the piers or pillars by transverse bolts passing through elongated holes in the ends of the bars, in order to allow for any unequal expansion or contraction of the metal, or any slight deflection of the curve caused by any great weight passing along the way; but it will be evident that this construction or combination of bars, rails, or ribs of metal, contains a principle of compensation in itself, which will relieve the expansion and contraction of the materials under variations of temperature. The "*edge rails*" upon which the running wheels of the carriages are intended to travel, are of a T shape in their sectional figure, and may be held between the two top rails of each range or series, their flanges resting upon these rails, as at *m*, *m*, in figs. 16 and 17, and they are secured by the transverse bolts and nuts, as shown in those figures.

Another pair of edge rails at a lower level may be placed upon the bars which connect the two pair of railways or double ranges, as shown at *o*, *o*, in figs. 15 and 16, which may be used in addition to the upper railways for the transportation of any light weights. It may be requisite in some parts of the railway to affix a shield or side guard, as shown at *p*, *p*, in figs. 15 and 16, which may be lined with iron plates for the protection of the carriages, when the way is elevated considerably above the ground; or in other cases a plain balustrade may be applied.

Having thus explained the principles upon which I obtain strength and stability by a peculiar arrangement and combination of diagonal, horizontal, and perpendicular bars, rails, or ribs of metal, and also having described the manner in which I propose to shape and connect the several parts so as to form a railway of an inproved construction, I claim under the above in part recited Letters Patent, the improved construction of railways or ways formed by the peculiar combination of several series of bars, rails, or ribs of metal, arranged and connected as herein above described.—[*Inrolled in the Rolls Chapel Office, December,* 1832.]

Specification drawn by Messrs. Newton and Berry.

To JOHN JACOB PARKER, *of Birmingham, in the county of Warwick, gentleman, for his invention of certain improvements in fountain pens.*—[Sealed 26th of July, 1832.]

THE Patentee states in his Specification of the above Patent, that his invention consists in the arrangement of the parts of fountain pens, whereby he produced pens capable of containing a supply of ink, which may be made to flow to the nibs at the time of using, and afterwards to cause any ink remaining in the pen to flow back into the handles or upper parts.

Plate IX. fig. 1, shows one of these fountain pens complete. Fig. 2, is a section, taken through the same, showing the relative situations of the parts. Figs. 3, 4, 5, and 6, are detached representations of some of the various parts of which the pen is composed: the same letters being marked on similar parts in all the figures; *a,* is the outer case or handle of the pen; fig. 3, is a section of the cap or cover *b,* shown detached; on the inside of this cap or cover *b,* is fixed a pin *c,* this pin acts as a plug or stopper to the ink way when the pen is not in use, the cover *b*, being placed over the nibs to protect them; by this means the flow of ink will be prevented, excepting when the pen is used; ***d***, is a piston, the rod of which has a screw cut thereon, a three threaded left handed screw being preferred, as it obtains a more easy motion to the piston.

The piston rod is flat on two sides, and passes through a rectangular hole formed in a cross plate *f*, affixed in the ink cylinder, the piston being thereby kept from turning round, as it is forced up and down by the motion of the screw upon the rod, as will be more fully described hereafter; *e*, is the ink cylinder, or chamber which contains the ink, and in which the piston is caused to rise and fall by means of the piston rod.

At the upper end of the ink cylinder *e*, is affixed the circular plate *f*; through this plate is formed a rectangular perforation, in which the piston rod works, and thus the rod is prevented turning round; *g*, is a ring, placed above the plate *f*, to enable the tube *h*, to turn freely; the end of this tube *h*, has an outward flange *i*, which comes against the ring *g*, shown more particularly in the detached view fig. 4, of the tube *h*, and its flange *i*.

The tube *h*, is kept in its place within the upper part of the ink cylinder by means of the short tube *j*, which slides over the tube *h*, and is soldered into the upper part of the ink cylinder, and thus the flange *i*, of the tube *h*, is securely retained between the ring *g*, and the tube *j*.

Within the end *i*, of the tube *h*, is formed a few threads of a female screw, and the piston rod being passed within the screw and tube *h*, on turning the tube *h*, round, it will cause the piston to be forced down the ink cylinder and supply the pen with ink. The piston may also be withdrawn when ink is no longer desired in the pen, by turning the tube the reverse way, by which latter action the ink, which is unused, will be returned to the ink cylinder; *k*, is the top part of the outer casing of the pen, which has a small hole perforated in its end for the pin *c*, to pass through; when the cap or cover *b*, is placed on the upper end of the pen for the purpose of elongating the handle, as is shown by dotted lines in fig. 1. There is a pin passed through the outer casing *k*, and the inner tube *h*, so that when the outer tube *k*, is put in its place, and turned backwards or forwards, it will cause the tube *h*, to turn in a like direction, and thus actuate the piston within the ink cylinder.

To the lower end of the ink cylinder is affixed by soldering the pen holder *z*, which is shown separately in fig. 5, and in section, at fig. 6, and consists of two tubes *l*, and *m*; the inner one *m*, having a small hole drilled through it for the passage of the ink from the cylinder, as is more clearly shown in the sectional figs. 2, and 6, it will be seen that the hole or ink way is opened, or made bell mouthed, in order that the ink passing from the ink cylinder may have an inclination to fall immediately on to the nibs of the pen.

The Patentee having described the various parts, and the manner of combining the same, he proceeds to describe the manner of filling and using the pen. In order to fill the ink cylinder, the piston is first forced down to the lower end of the ink cylinder; the end which forms the nib holder is then dipped into ink, when the piston is to be made to move upwards, by which means the ink will be passed into the cylinder by the atmospheric pressure, and the cylinder will become filled with ink. The nibs, whether of quill or metal, are then to be put into the holder between the tubes *l*, and *m*, and the pen will be fit for use. A constant supply of ink may be kept to the nibs whilst writing, by turning with the left hand the part *k*, of the outer casing. The Patentee observes, that he prefers left handed screws to be made on the piston rods, by which the desired motion for supplying ink to the nibs will be more readily communicated.

When the pen is no longer desired to be used, the part of the casing *k*, is to be turned in an opposite direction, which will cause the piston to be raised in the ink cylinder, and consequently any ink which remains in the lower part of the pen or nib holder will be made to follow the piston by the pressure of the atmosphere; the cap or cover *b*, is then to be placed on the lower end, and the wire *e*, will plug up the end of the ink way in the holder, and thus prevent the flow of the ink in case the pen should be laid horizontally, as well as keep the passage at all times clear when the plug is withdrawn.

The Patentee states, in conclusion, "That having now described the nature of my invention, and the manner of carrying the same into effect, I would observe that I construct the same of gold, silver, or other suitable material, taking care that the ink cylinder is constructed of such a material as will be as little as possible acted on by the ink; and I do declare that one of the objects of my invention is the lining of the ink cylinder with a tube of glass, or I form the ink cylinder wholly of glass, or I sometimes line such ink cylinder with gold, to prevent the injurious effects of the ink, and it will be evident that the outer casing may be ornamented by engine turning or otherwise, and that the same may have a seal or other device on one end, taking care that there is a small hole drilled to admit the air to prevent a vacuum being formed in the cover when it is removed for the purpose of using the pen.

"I would have it understood that I lay no claim to the various parts of which the invention is combined, they mostly being known and in use in their separate condition. But what I claim is, first the using two or more threaded screws for working the pistons in fountain pens, by which considerable power is obtained with the exertion of but a small force, in consequence of the slow progress of the screw, yet by such means a very careful adjustment may be obtained in supplying ink to the pen; and although I have here stated a two or more threaded screw, I prefer a three threaded screw.

"Secondly, I claim the use of a left handed screw to the working of the pistons of fountain pens, by which the supply of ink is more readily obtained whilst the pen is in actual use in the right hand.

"Thirdly, I claim the particular combination of the various parts as a fountain pen, although such parts are in themselves well known and in use; and, fourthly, I claim the lining of the ink cylinder with glass or gold to prevent the prejudicial corrosive action of the ink, which in most other materials is very great, though in many common articles I sometimes omit such linings of glass or gold, yet I prefer the using of such materials, as the pens will be much more lasting by the application."—[*Inrolled in the Inrolment Office, January,* 1832.]

To Harry Scrivenor, *of New Broad-street, in the city of London, gentleman, for his invention of a certain improvement or improvements in the construction of iron railways.*—[Sealed 6*th November,* 1832.]

The nature of the above invention is stated by the Patentee to consist in constructing those parts of railways usually called chairs or pedestals of wrought iron, instead of cast iron, heretofore used for that purpose, and either in one single piece or more pieces as may be thought best for the particular railroad on which they are intended to be used; and describes his improvements in the following manner, reference being had to the several figures of this invention in Plate VI.

In fig. 17, *a*, *b*, represent a pair of cast iron metal rollers, mounted in proper frames or bearings, and having a series of grooves or indentations in their peripheries corresponding with the several shapes which the metal is intended to take during its progress through these rollers in the operation of rolling, until it at length attains the exact shape required to form the chairs or pedestals; for example, the grooves or indentations at *c*, *d*, are formed to receive an ordinary, short, thick, bar of wrought iron, of the size adapted for these rollers, say about two feet long, and six inches square, brought to the required heat for rolling.

The heated bar is first passed through the rollers at *c*, *d*, which causes it to assume the shape shown at *j*; it is then passed in succession through the other grooves *k*, *k*, *l*, *l*, *m*, *m*, and *n*, *n*, whereby it is successively rolled into the forms shown at *e*, *f*, *g*, *h*. Having thus obtained a long bar or length of iron, of the form shown in section at *h*, it is next cut into proper lengths for chairs, which is done by means of a pair of mill shears of the common construction, which may be worked in the ordinary manner; but these shears must be provided with jaws of a proper shape and form to receive the chair or bar *h*, otherwise the action of the shears in cutting off the lengths from the bar would be apt to force it out of shape.

It may be well here to observe, that as the forms of the chairs would necessarily vary to suit the form of rails to be used with them, and the Patentee has shown and described only one form of rails, which he has selected as being one of the most approved form, and in general modern use, and states that chairs may be made of wrought iron on the same "principle" above described, to suit any of the ordinary forms of rails now in use; and then proceeds to describe the chair, constructed as above, for the rail shown in section in fig. 18.

Having cut the rolled bar *h*, into proper lengths for chairs, the next process is to shape the cheeks *o*, *p*, (see the sectional fig. 19,) more accurately to fit the rails, to be placed in the chair, which in its present state would have the appearance shown in fig. 19, and of course would be too unsteady for the purpose required. In order to effect this shaping, and to form at the same time a proper recess in the cheek *o*, for the key used to wedge up the ends of the rails tight in the chair, a cold wrought or cast iron mandrill *i*, (as shown at figs. 20, 21,) is placed in the recess in the chair, which, having been previously heated again in the furnace, is made to pass through another pair of rollers, as shown at fig. 22, together with the mandrill, which rollers press the cheeks *o*, *p*, close upon the mandrill *i*, and when the chair leaves these rollers, it is complete; and the mandrill being withdrawn, the rail may now be inserted in it, as at fig. 23; *r*, being the recess into which the wedge or key is to be driven, to fix the rails firm and steadily in their places; *z*, *z*, are the holes for the spikes or fastenings which confine the chair to its block or support.

Fig. 24, is a vertical section of a wrought iron chair, made of more than one piece; in this chair the cheeks are made to fit the rail by rivetting pieces of iron of the proper shapes to the cheeks of the chairs after they leave the rollers, as at *n*, *n*, in fig. 17, in which case they will not require to be passed through the rollers fig. 22. The cheeks *o*, *p*, of the chair having plain sides, and parallel to each other, pieces of rolled iron *s*, *t*, are firmly secured to the insides of them by rivetting, as shown in the figure. Fig. 25, shows

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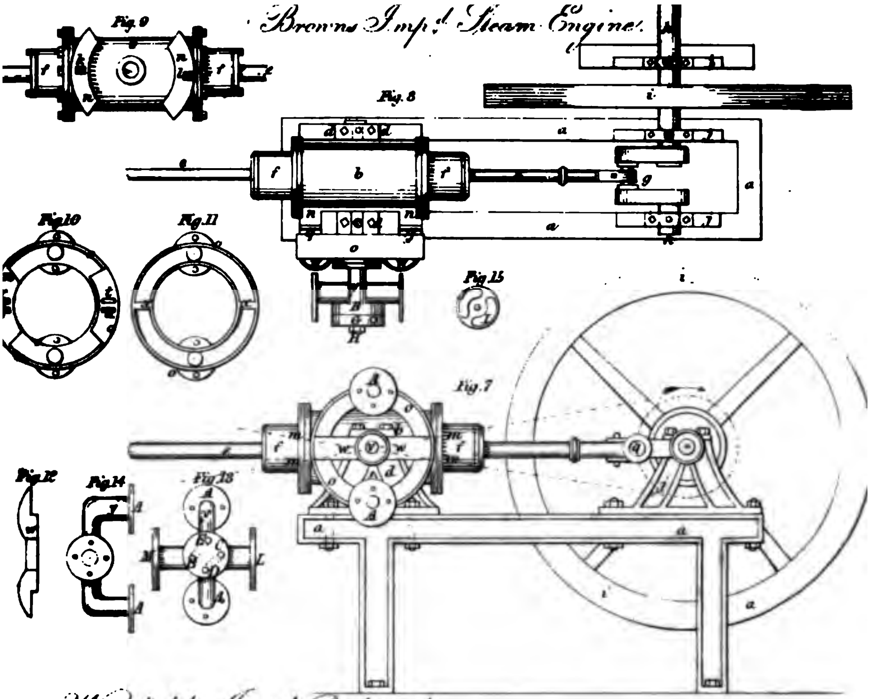
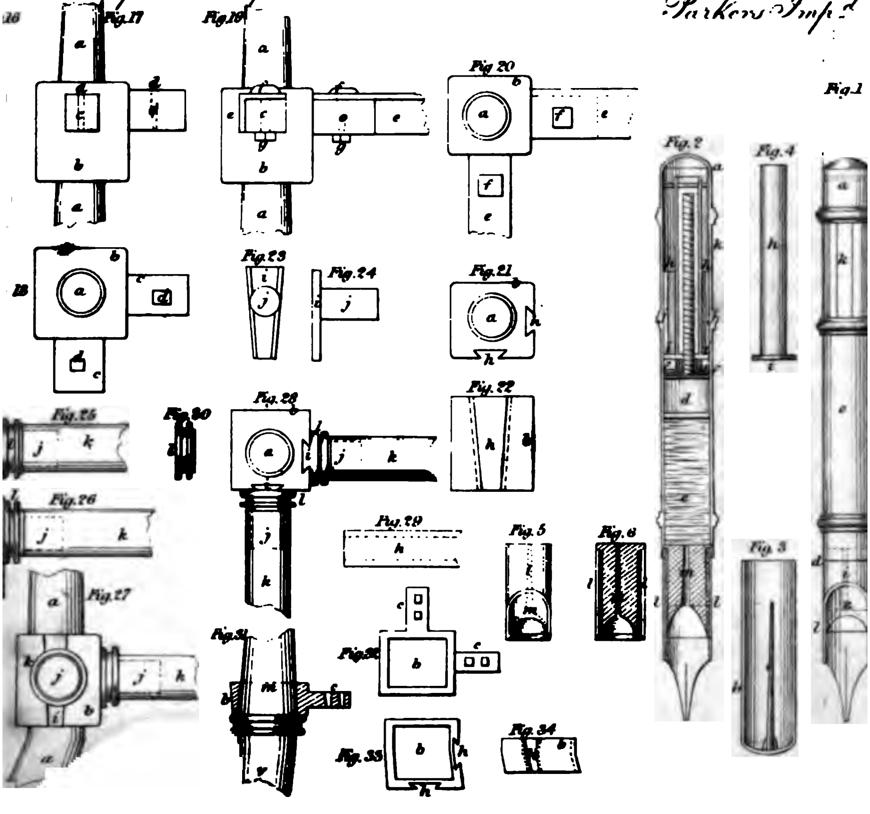
ASTOR, LENOX AND
TILDEN FOUNDATIONS.

Browns Impd Steam Engine.



Winfields Impd Bedsteads.

Parkers Impd



the chair, with a wrought iron rail placed within it, and secured firmly by means of an iron wedge or key driven tight in underneath the overhanging piece *s*, and pressing upon the shoulder the rail *q*. This plan of wrought iron chair will be found useful when thelower part of the rail for which it is intended may be of any shape differing from the ordinary kind. Fig. 26, is a side view of a chair, with a part of a rail place with it; and fig. 27, is an elevation of another broader chair calculated to receive the ends of two rails at a junction.

Having described the nature of his invention, the Patentee states in conclusion, that he claims as his invention, "the substitution of wrought or malleable iron in place of cast iron in the construction of those parts of iron railways called chairs or pedestals, whether the same be made in one single piece or of separate pieces rivetted or otherwise fastened together, as hereinbefore described."—[*Inrolled in the Inrolment Office, January,* 1833.]

To WILLIAM BROWN, *of Liverpool, merchant, for certain improvements in steam engines, communicated to him by a certain foreigner residing abroad.*—[Sealed June 9th, 1832.]

THIS invention is described by the Patentee to consist in a certain arrangement of apparatus for producing a slide valve to a vibrating cylinder of a steam engine, whereby the steam will be alternately admitted to the cylinder, and cut off therefrom by the vibration of such cylinder.

Figure 7, Plate IX, is an elevation of the engine, and figure 8, is a plan view thereof: the same letters indicate similar parts in all the figures; *a, a*, is the framing on which the engine is mounted; *b*, the engine or steam cylinder which vibrates on axes *c*, *c*, turning in bearings *d*, *d*, one on each side of the cylinder; *e*, is the piston rod, which it will be seen passes through both covers of the steam cylinder, there being stuffing boxes *f*, *f*, formed on the covers at each end of the cylinder; these stuffing boxes are made considerably longer than is usual with fixed engines, the object being to give as much bearing at each end of the cylinder for the piston rod as possible; into these stuffing boxes is placed hemp, cotton, or other material usually employed for packing, and keeping the covers of the cylinders steam tight at the parts through which the piston rod works; *g*, is the crank to which the piston rod is applied by the strap and keys, as usual, and *h*, is the main shaft, to which is to be connected any mill work, or other machinery, which the engine is intended to drive; *i*, is a fly wheel affixed to the shaft *h*: this shaft *h*, turns in bearings *j*, *j*, which are screwed to the top of the framing *a*, *a*.

In fig. 7, the dotted lines indicate the positions to which the vibration of the cylinder *b*, on its axis, causes it to assume, by which it will be evident that the steam ways or apertures formed at each end of the cylinder, as is shown at *k*, *l*, in fig. 9, which is a side view of the cylinder, will at each vibration of the cylinder, be caused to move through a space equal to that between the dotted lines *m*, *m*, at each end of the cylinder, and thus with such openings be alternately brought to the induction passage, or to the point, at which the admission of steam to the cylinder takes place, and then to the eduction passage, or the point at which such steam, after having acted on the piston, is emitted from the cylinder, either to the condenser or into the open air, according whether the engine is used as a condensing or a high pressure engine.

In figs. 8 and 9, *n*,*n*, are two ground surfaces or plates affixed to the side of the cylinder through which the openings or apertures *k* and *l*, are formed, which admit steam on each side of the pistons; these plates *n*, *n*, are caused to slide or act against two similar ground plates of the steam box or pipe *o*, and eduction ways hereafter described.

In figs. 7 and 8, *o*, is a circular flat pipe or box for admitting steam into and out of the steam cylinder, a plan of which is shown separately in fig. 10, and a section thereof in fig. 11, by which figures its formation and construction will be readily understood. On to the side next the steam cylinder there are two ground plates *p*, *q*, having two openings or apertures in each plate at *r*, *s*, and *t*, *u*, for the admission and emission of steam, as will be fully described hereafter; this circular pipe or box is kept to the position shown at figs. 7 and 8, the screw *v*, passing through the clamp *w*, shown separately in fig. 12, the lower part of the circular pipe being supported by the framing *a*.

It will be seen by the section of the circular pipe fig. 11, that there are two partitions *x*, *x*, which are between the openings or apertures *r*, and *s*, and *t*, and *u*, so that when the steam fills the lower compartment or division of the circular pipe *o*, the upper compartment or division acts as an eduction way for the steam, for both ends of the cylinder, and when the upper compartment is the compartment open to the boiler, then the lower compartment acts as an eduction way for the steam to escape from the ends of the cylinder. In fig. 8, *y*, is a branch pipe, shown in detached figs. 13 and 14; this branch pipe is affixed by means of its flange A, to other flanges A, formed on the circular pipe *o*, by means of screw bolts and nuts. On the front of the branch pipes *y*, is formed the circular plate B, having four holes C, D, and E, F, which enter into the branch pipes *y*, such pipes having no direct communication the one with the other; G, is another circular plate, shown detached in fig. 15, and in its place in fig. 8, this plate is screwed in front of the plate B, by the screw H, and in such manner that the cavities or recesses I, and J, shall connect the holes C, D, and E, F, that is, the cavity I, shall cause there to be a connexion or steam way from E, to F, the object of which will be fully described hereafter; K, is a hole, drilled into the plate G, into which a handle or lever is to be inserted, when it is desired to turn it to open or shut either passage.

The surfaces of the plates B, and G, are accurately ground, so that when they are screwed together, they shall be steam tight, and only permit the steam to pass by the cavities or ways, as before described.

Having now described the various parts of the engine, the Patentee proceeds to describe the manner of its action, in doing which, it must be supposed that the steam pipe leading from a boiler, is connected with the flange L, of the branch pipes *y*; the steam would then flow through the aperture or way C, in the plate B, through the way D, and thence into and fill the lower compartment of the circular pipe, or steam box *o*; the steam will pass from thence into the steam cylinder *b*, whenever either of the ways or apertures *k*, and *l*, are opposite the openings or apertures *u*, and *s*, and the steam will be emitted from the ways or aperture *k*, and *l*,—whenever either of these openings are opposite the apertures *t*, and *r*, respectively; for instance, supposing that the crank moved in the direction of the arrow, the outer end of the cylinder *b*, would be depressed, and the aperture *k*, would be open to the lower compartment of the steam pipe *o*, at *u*, and steam would flow into the cylinder to actuate the piston; meanwhile, the aperture *l*, of the cylinder *b*, would be opposite the aperture *r*, by which the steam, after having acted on that side of the piston, would pass into the upper compartment of the circular pipe or box *o*, either to a condenser, or to the open air as required. The continued rotation of the crank *g*, would cause the other end of the steam cylinder to be depressed, by which the steam would be cut off from the aperture *k*, and opened at the aperture *l*, which would bring the aperture *k*, to be opposite the aperture *t*, to allow of the emission of the steam from that side of the piston.

It will be evident that the surfaces of the plates *n* and *u*, and *p*, *q*, must be very accurately ground, or have elastic packings, in order to keep the same steam tight. In case the engine is intended for a condensing engine, then the pipe which leads to the condenser is connected to the flange M, and it will be necessary to apply the requisite parts, and cause them to be worked by the engine. If the engine is intended for a high pressure engine, then it will only be necessary to attach a pipe at the flange M, to convey the steam from the engine in the direction required. When it is desired to change the working of the engine, or to cause the crank to turn in the opposite direction to that which it has been working, it will only be necessary to turn the plate G, by means of a lever or handle placed in the hole K, in such manner that the cavities I, and J, shall open a way between C, and E, and D, and F, by which means the upper compartment of the pipe *o*, will be converted into the steam compartment, and the lower compartment into the eduction way for the steam after it has actuated the piston.

Having described the nature of this invention, the Patentee states in conclusion, "I would have it understood that I lay no claim to a steam engine having a vibrating cylinder, that description of engine being well known and in use; but what I do claim is the arrangement of the plates *n*, *n*, on the steam cylinder *b*, and the plates *p*, *q*, on the circular steam pipe *o*, which are caused to act together as slides for admitting and cutting off the supply of steam by the vibration of the steam cylinder, as above described.—[*Inrolled in the Inrolment Office, December,* 1832.]

To ROBERT WALTER WINFIELD, *of Birmingham, in the county of Warwick, brass-founder, for his invention of certain improvements in the construction of bedsteads, one or more of which said improvements is or are likewise applicable to other articles.*—[Sealed 22d December, 1831.]

THE Patentee states in his Specification of the above, that one of his improvements consists in making the legs and pillars of bedsteads of one entire tube, either formed of metal, or of metals containing wood or other materials, withinside the said tubes; these tubes may be either of the same size throughout, or made larger below, and smaller above, or the reverse, and formed either cylindrically or tapering; by this mode the ordinary method of forming the legs or pillars of metallic bedsteads of two or more parts. screwed or otherwise fastened together, is avoided, and consequently a degree of firmness is attained, and labour saved.

Another improvement consists in the methods of affixing the sides and ends of metallic bedsteads to the legs and pillars formed of entire tubes.

Fig. 16, Plate IX, represents part of a leg and pillar for a metallic bedstead, shown in section, the upper part having been reduced in size by drawing it through proper tools in the usual manner. Fig. 17, is an elevation; and fig. 18, a plan of part of a similar tube *a*, *a*, upon which a square metal boss or corner of a bedstead *b*, has been affixed by forcing the tube *a*, *a*, through a hole in it up to the part where it is required to remain; when it is firmly secured in its place, by screws or otherwise. From two sides of the boss *b*, plugs *c*, *c*, project, to which angle iron sides are affixed by screws and nuts, the screws passing through holes *d*, *d*, in the plugs *c*, *c*. Fig. 19, and fig. 20, are similar views to figs. 17 and 18, showing the angle iron *e*, *e*, attached to the plugs *c*, *c*, by the screws *f*, *f*, and nuts *g*, *g*.

Instead of forming projecting plugs upon the bosses *b*, to receive the angle iron, the Patentee sometimes forms dovetail grooves in two of the sides of the bosses, as shown at *h*, *h*, in the plan and side views, figs. 21 and 22, into these dovetail grooves *h*, *h*, are inserted the dovetailed pieces *i*, *i*, figs. 23 and 24, which are formed on the ends of cylindrical metal plugs *j*, *j*.

These plugs *j*, *j*, are inserted and firmly affixed into the ends of metal tubes *k*, intended to form the sides and ends of the bedsteads, as shown in figs, 25, 26, 27, 28, and 29; fig. 27, being a side, and fig. 28, a plan view, and showing parts of two tubes *k*, *k*, united therewith. Fig. 29, represents part of a tube *k*, to be fitted on the plug *j*, and is afterwards to be covered with a ring or ferrule *l*, fig. 30, as shown in figs. 25, 26, 27, 28, and 29, for strength and ornament. Another of these improvements consists in the application of metallic sides and ends, and also metallic substitutes for sacking to the wooden legs and pillars of bedsteads, with a view to the preventing the harbouring of bugs, fleas, &c.

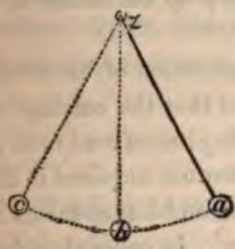
This improvement is effected in the following manner:—fig. 31, represents part of a wooden leg and pillar of a bedstead, upon which is affixed a square metal boss *b*, with two square plugs *c, c,* to receive angle iron in the way above described, or dove tailed grooves may be formed in two of its sides, in order to receive dovetailed pieces of metal mounted on the ends of metallic tubes, instead of angle iron sides and ends ; fig. 32, is a plan of the boss *b,* with its two plugs *c, c* ; fig. 33, is a plan of another metal boss with dovetailed grooves *h, h,* made in its sides, to receive the solid metal dove tailed parts as above described ; fig. 34, is a side view thereof.

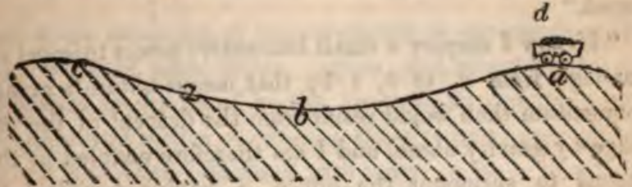
The Patentee states in conclusion, that although he has shown the apertures in the middle of the bosses, as being round or square, yet he does not intend to confine himself to those shapes only, but to make them hexagon or octagon, or any other form as thought desirable ; and further, that although he has hitherto described these improvements as applied to the construction of bedsteads only, yet he does not intend to limit himself to that application ; and states he also employs means of avoiding the usual methods of combining the parts of metallic and wooden bedsteads in any other case when it may be found expedient to do so, as for instance, in framing sofas, and concludes his Specification as follows :—

" I do not mean or intend hereby to claim the affixing the sides and ends of metallic beadsteads to the legs and pillars by means of plugs, where angle iron is used, or dovetails where tubes are used, to form the said sides and ends, but only in combination with my improved mode of forming the said legs and pillars in one piece, and of affixing the bosses upon them".—[*Inrolled in the Inrolment Office, June,* 1832.]

To RICHARD BADNALL, *the Younger, formerly of Ashenhurst-hall, near Leek, in the county of Stafford, but now residing in the town of Douglas, in the Isle of Man, gentleman, for his invention of an improvement in the construction or formation of the trams or rails or lines of rail or tram-roads, upon which locomotive engines shall or may work.*—[Sealed 8th September, 1832.]

THIS improvement in the construction or formation of the trams or rails, or lines of rail or tram-road upon which locomotive engines shall or may work, will be best illustrated by reference to the oscillation of a pendulum. If a plummet suspended by a string from the point *z*, be drawn away from the perpendicular line to the point *a*, and there let go, it will fall by its gravity to *b*, in the arc *a*, *b*, but on its falling it will have acquired so much momentum as will carry it forward up to a similar altitude at point *c*. Let it be supposed that a line of rails, or tram-way for carriages, be so constructed from the summit of two hills across a valley, that the descent from the one hill as *a*, to the valley *b*, shall subtend a similar angle from the horizontal line, to the ascent up the other hill from *b*, to *c*. Now if a tram-waggon as *d*, be placed at the summit of the declivity *a*, it will by its gravity alone run down the





descending line of rails to the lowest point *b*, but in so running, according to the principles of the oscillating pendulum, it should have acquired a momentum that would carry it forward without any additional force up the ascending line to the summit of the hill *c*, being at the same altitude as the hill *a*.

It is quite certain that this would really take place if the velocity of the momentum was not impeded by the friction of the wheels of the carriage upon their axles, and upon the rails on which they run. Hence subtracting the amount of friction as a retarding force from the momentum which the carriage has acquired in descending from *a*, to *b*, it will be perceived that the momentum alone would only impel the carriage part of the way up the ascent *b*, *c*, say as far as *z*.

The Patentee states in further explanation of his invention, that "it will now be perceived that the carriage *d*, would not only pass down the descending line of road from *a*, to *b*, by its gravity, but that the momentum acquired in the descent would also impel it up the second hill as far as *z*, unassisted by any locomotive power. In order therefore to raise the carriage to the top of the second hill, I have only to employ such an impelling force as would be sufficient to drive it from *z*, to *c*, the whole expense of locomotive power for bringing the carriage from *a*, to *z*, being saved."

"If now I employ a small locomotive power to impel my carriage from *a*, to *b*, I by that means obtain a greater momentum than would result from the descent of the carriage by gravity alone, and I am therefore enabled by that means to surmount the hill *b*, *c*, having travelled the whole distance from *b*, to *c*, on the undulating line of road with much less locomotive power than would have been requisite to have impelled the carriage the same distance upon a perfectly horizontal plain.

"Having now set out the principles upon which my improvement in the construction of tram-roads or railways are founded, I desire it to be understood that I claim as the subject of my invention the forming of trams or rails, or lines of rail or tram-roads, in such an undulating curve or curves as will enable me to combine the advantages of momentum from gravity when running down the descending curves of hills, with the power of locomotive engines to be employed thereon; I do not confine myself to any particular extent of line or form of curve, but vary and adapt the curve or curves according to the surface of the country, or the local circumstances."—[*Inrolled in the Inrolment Office, March,* 1833.]

Specification drawn by Messrs. Newton and Berry.

To FREDERICK WILLIAM ISAAC, *of Charlotte-street, Fitzroy-square, in the county of Middlesex, ivory, tortoise-shell, and pearl worker, for his having invented certain improvements in ornamenting the finger keys, and other parts of piano-fortes, organs, and other musical instruments.*—[Sealed June 28th, 1832.]

THE above invention of improvements in ornamenting the finger keys of piano-fortes, organs, and other musical instruments is described by the Patentee to consist in new and improved modes of covering those parts of them which are usually either veneered with ivory, or made of ebony, with pearl, tortoise-shell, turtle-shell, or other fit and proper, rich and beautiful materials, so as not only to add greatly to their splendid and elegant appearance, but also, from the superior hardness, glossiness, or high polish of their surfaces, to facilitate the rapidity of the fingering in the performance of quick and brilliant passages in musical compositions.

In covering the finger keys with pearl, the Patentee employs the following improved method, which is described in the Specification in the following manner:—"Instead of merely cementing flat plates or lamina of pearl to the wooden parts of the keys, by means of glue, as usual, I compose a superior cement in the following manner: to a solution of the best Salisbury or other English glue made in a leaden glue pot, with fresh ale to a proper consistency, I add a small quantity of isinglass which has been previously dissolved in a mixture of ale, and of acetic acid or vinegar by a gentle heat, and also a little boiled linseed oil; and when the whole have been thoroughly incorporated by stirring them together at a simmering heat, I add a sufficient quantity of the fine German carbonate of lead, called "Khrem's White" in commerce, or the finest plaster of Paris, finely powdered and sifted, to give to the cement a uniform white colour. The intent of these additions to the solution of glue in all being to give it the power of resisting the atmospheric changes of heat and cold, and moisture and dryness, and also to suit it to the white colour of the pearl, and therefore these said additions must be varied in their proportions accordingly, and agreeably to the different qualities of the said component materials.

"In addition to this superior cement, and especially to guard against the ill effects of hot climates, I introduce between the lamina of pearl and the wooden part of the keys, a slip of cloth, such for instance, as hempen, linen, or cotton shirting, or of woven silk, or the fine woollen fabrics known as cashmeres or merinos, or cloths of any other materials, and of about the same thickness as the above; or instead of cloth, slips of vellum or parchment may be also used with advantage, the intent being to counteract the great tendency of glue to shrink and contract in drying, and thereby cracking and loosening by the introduction of the above, or similar partially elastic and yielding materials.

"I fill the pores or interstices of the said cloth with the above composition or improved cement, by laying it upon the wooden part of the finger key, and by repeatedly striking the brush, or Dutch painter's tool filled therewith, upon the surface of the said cloth, until they are completely saturated therewith, and the cement passes through and effectually binds the cloth to the wood, when they are to remain till they become perfectly dry. I then coat the surfaces of the cloth, and of the pearl, with the cement in a similar manner as when the common glue is used, and laying them together in their place, I employ the heated caul in the ordinary manner of veneering, to press the parts together, and to expel the extra quantity of cement which would otherwise remain.

"In using vellum or parchment instead of cloth, I merely brush them over with cement, instead of striking the brush upon them in the manner above described.

"When the cement is become hard, the pearl is to be cleaned off, and prepared for polishing in the German manner; first with pumice stone, powder and water, and then with rotten stone, powder and sulphuric acid, applied upon a soft woollen cloth, with which the pearl must be rubbed until a beautiful polish is obtained. I can also employ the above cement and cloth, vellum or parchment, in veneering the finger keys with ivory and with similar advantages.

"In veneering the short finger keys with tortoise-shell or turtleshell, I employ a similar cement to that before described, only that it is coloured yellow, green, maroon, red, black, or of any other colour required, by using properly ground and sifted colours accordingly; I likewise have the cloth dyed of similar colours, and cement it upon the wooden parts of the keys, in the manner above mentioned. I then apply the tortoise-shell or turtle-shell with the cement, in the usual manner of veneering with tortoise-shell; and, lastly, polish it also in the usual way."

In order, however, to facilitate the process of veneering the short finger keys with tortoise-shell or turtle-shell, as well as also to render it more durable, and instead of laying the shell upon the wood in several parts or pieces as usual, the Patentee forms the shell into a solid cap or coat, in the shape of the key by means of male and female dies employed in a screw press of the common construction, and immersed in boiling salt water.

The boiler described in the Specification to be used for this purpose is a square cast iron or other metallic box open at the top, and placed over a small furnace or German stove. The press and shaping dies, with the tortoise or turtle-shell to be operated upon, are placed into this boiler, and submitted to the action of boiling salt water. On the top of the press there are two projecting pieces or stretchers to steady the press in the boiler, and on the sides of the boiler are formed guides to steady the bottom plate of the press within the boiler.

The pair of dies employed for this purpose are of the required shape, to form two coverings or veneers for the short finger keys at one time; the lower die containing the recess is placed upon the bottom plate of the press, and the upper one is moved up and down the press of the screw between guides in the usual manner.

The projecting part of the top die is made to fit the hollowed part of the top die, in such a manner as to allow of a sufficient thickness of tortoise or turtle-shell to lie between them when compressed by the action of the screw of the press (which is turned by a lever projecting over the top of the boiler), so as to form two caps or coats in length at one pressing, which may be afterwards cut into two parts or coverings for the short finger keys.

Having described the methods of ornamenting the finger keys of musical instruments, the Patentee proceeds to describe the other parts, to which these improvements are applicable, and proposes to ornament " the name boards, the key slips, the cheek pieces, and the candle boards; all these may also be advantageously veneered with tortoise or turtle-shell, or with buhl, at discretion, by employing the above mentioned improved cements, and introducing the cloth, vellum or parchment in either of the before mentioned methods; and further states, in conclusion, I can likewise greatly improve the art of veneering the cabinet or wood parts of musical instruments with common glue, by introducing a bed of linen, hempen, or cotton sheeting, in the above manner. I do not mean or intend hereby to claim as my invention any of the various means or methods herein mentioned which may already have been known or in use; but I do hereby claim the introduction of the woven fabrics or cloths, or vellum or parchment, in order to afford a degree of elasticity to the glued or cemented veneers; and I likewise claim the formation of the tortoise-shell and turtle-shell caps or coats for the short finger keys in one solid piece, by means of the screw press and dies, instead of veneering them with separate pieces."—[*Inrolled in the Inrolment Office, December*, 1832.]

NEW PATENT LAWS.

In our last we gave as correct a statement of the several clauses proposed in Mr. Godson's Bill for amending the Patent Laws as we were then able to furnish, and which it appears was very nearly a literal copy of the Bill itself. That there were some points not exactly calculated to produce the best results, must have been obvious to most of our readers, and on a measure of such importance to the inventive portions of the community, all the bearings of which could not perfectly seen by the learned gentleman who proposed the Bill, a few suggestions resulting from an extensive practical acquaintance with Patents, and the legal proceedings upon those subjects, may not be deemd intrusive.

We have therefore drawn out the scheme of a Bill embodying those amendments, which appear to be necessary, not captiously differing from the proposer on any trifling unimportant points, but embracing as much of his measure as we conceive would be condusive to the establishment of a useful code, and adding our views by alterations or additions to such clauses as appeared to be insufficient or inadvisable.

We are, however, far from supposing that the views which we have taken will obtain the approval of every Patentee, or indeed must the necessities of the case in every particular, but they may serve as a guide to the proceedings of such public meetings as we find are about to be held in many of the large manufacturing districts, in compliance with the suggestion which we offered in our last.

Proposed Bill, amended.

Whereas it is expedient that the Laws respecting Letters Patent for Inventions should be explained and amended; *Be it therefore*

Enacted, by the KING'S most Excellent MAJESTY, by and with the Advice and Consent of the Lords Spiritual and Temporal, and Commons, in this present Parliament assembled, and by the Authority of the same, THAT, notwithstanding any Law or Custom to the contrary, His Majesty is hereby empowered to grant Letters Patent for the terms of *Seven* Years or *Fourteen* Years, as is hereafter expressed and enacted, for the sole making, working, exercising, and vending of any new Invention or discovery of a new or improved Machine, Structure, Apparatus, Process, or Product, applicable to any of the Arts or operation in Science, Manufactures, or Agriculture, which shall not be publicly known, or practised in these Kingdoms at the time of granting such Letters Patent; provided that the same be beneficial to the Public, and not mischievous to the State: upon condition that the said Patentee shall particularly describe and ascertain the nature of the said Invention, and in what manner the same is to be performed, by an Instrument in writing under his hand and seal, and cause the same to be inrolled in the High Court of Chancery within a limited time next after the date of the said Letters Patent.

Subjects for which Patents shall be granted.

AND whereas it shall be lawful to grant Letters Patent for any newly contrived Machine, Engine, or Apparatus; and for any Improvements in existing Machines, Engines, or Apparatus; and for any new or improved Combination, Arrangement, or Adaption of Material things, whether Mechanical or Chemical, which shall produce a useful result; and for any new or improved Manufacture, Process, or Mode of Operation, designed for the purpose of accomplishing a beneficial object: provided the same shall not be publicly known or in use in these Kingdoms.

To whom to be granted.

AND whereas it shall be lawful to grant Letters Patent for either of the terms of Years above stated, on Petition to the King's Most Excellent Majesty, to any Person or Persons, whether

Subjects of the Realm, or Foreigners residing or domiciled in these Kingdoms, for any such new Invention, Discovery, or Improvement, whether the same has been invented or discovered by the said Petitioner, or was invented abroad, and communicated to him; an affidavit of the facts being made by the Petitioner, and presented with his Petition.

Claiming too much not to annul the whole.

AND whereas it may happen that through ignorance, and without any intention of fraud or deception, a Patentee may include in his Specification as new, certain parts of a Machine, Structure, Improvement, Process, or Product, which may have been used, or partially known, in these Kingdoms before the Grant of the said Letters Patent; let it be enacted that such part or parts of the Specification being bad, shall not vitiate the whole, but that the Patentee shall lose all exclusive right to such known parts, yet retain those parts which are new. AND whereas it may happen that the said Invention or Discovery, or certain Parts of the same, may have been, either privately, or in an imperfect manner, employed in some parts of these Kingdoms; BE it Enacted, that if the same shall not have been in public use, within Ten Years from the Date of the said Letters Patent, that such knowledge or use of the Invention shall not invalidate the said Patent Right, in the whole or in part.

Preparatory Specification.

AND be it further Enacted, That the said Petitioner shall make a short description of his Invention, to be called a "Preparatory Specification," which shall contain an outline or sketch of his said Invention; and that he shall deliver the said Preparatory Specification, sealed up with the said Petition, at the Office of the Secretary of State for the Home Department, and thereupon paying the Fees hereinafter required.

Report of the Attorney-General or Solicitor-General.

AND be it further Enacted, that the said Petition and the said Preparatory Specification, so sealed up aforesaid, shall be referred by the said Secretary of State to his Majesty's Attorney or Solicitor-General, who shall report thereon and make out a Bill, as heretofore, and that the said Bill be carried to the other Offices, for the purpose of Letters Patent being made out and receiving the Great Seal of England.

Board of Scientific Advisers.

AND whereas it is necessary for the detection of Frauds and the prevention of improper Letters Patent, and also for the determination of the priority to be given to Letters Patent, that his Majesty's Attorney or Solicitor-General should have the assistance of men practically versed in Arts and Sciences; BE it further Enacted, that the Attorney-General and Solicitor-General be empowered to appoint a certain number of Persons learned in the Arts and Sciences, and Manufactures, to constitute a consultive Board, all Petitions to whom for Letters Patent, and all Specifications shall be referred, for the purpose of advising the consciences of the Attorney or Solicitor-General as to his Report upon the Petition to His Majesty.

Priority of Patent Right.

AND be it further Enacted, that in order to prevent any irregularity as to priority of Patent Rights, every Patent shall be secured (if ultimately granted) from the day and hour of presenting the Petition: provided the Petitioner causes all subsequent Fees to be paid, and application to be made at the proper Office for appending the Great Seal to his Patent within *Three Months* from the date of his Petition: in default of which all Fees paid, and Privileges resulting therefrom, to be forfeited.

Caveats to be entered against the Report.

AND whereas it is highly important for the protection of Experimentalists and others who are intending to solicit Letters Patent for Inventions, that Caveats should be received by the Attorney and Solicitor-General, in order to prevent surreptitious Patents passing the Report; BE it Enacted, that Caveats may be entered as heretofore, to be in force for one Year, against any Patent passing the Report for a specific object named; and that on entering such Caveat, the Party claiming an Invention shall be bound to deliver a Sealed Packet containing a preparatory Specification or Explanation of the Object to which his Invention or Discovery applies, and a general Description of the Principles or leading features by which he proposes to carry the same into effect, and on which his Invention rests.

Hearing of Caveats.

AND be it further Enacted, that on the presentation of a Petition to the Attorney-General or Solicitor-General, for the grant of Letters Patent for any Invention or Discovery, the Deputy or Clerk of the Office shall give notice in writing of the same to all Parties claiming under Caveats the right to an Invention for a similar object; which Parties shall be at liberty to question (within fifteen Days) the right of such Petitioner, and to demand a hearing before the Attorney-General or the Solicitor-General, and their Board of Scientific Advisers, upon the merits the respective claims, as set out of in the preparatory Specifications of the Petitioner and of the Opponents. And that at such hearing before the Attorney-General or Solicitor-General and his Board of Advisers, the said preparatory Specifications shall be opened, and if it should appear necessary, further information shall be called for from all Parties claiming to be heard; and if the Invention of the Petitioner shall be found not to interfere with those described under the opposing Caveat or Caveats, and no other legal objection exists, the Attorney-General or Solicitor-General shall then sign an approbatory Report to his Majesty, recommending the grant of Letters Patent to the Petitioner; the costs of every such hearing (not exceeding £5. 5*s.*) to be paid by the opposing party.

Adjudgment of Prior Right.

AND be it further Enacted, that if the Invention of the Petitioner, and that claimed under an opposing Caveat, shall be the same, or interfering with each other, in the opinion of the Attorney-General or the Solicitor-General, and their Board of Advisers; that then the Attorney-General or Solicitor-General shall call further Evidence, in order to determine to which of the Parties a priority of right shall be adjudged as to the whole or to certain parts of the Invention; and he shall be empowered to determine to whom the right of Letters Patent shall be granted for any part or the whole of the said Invention; and the Attorney or Solicitor-General shall order the costs of such hearing to be paid by either or both parties, as he shall see fit.

Costs of Letters Patent.

AND whereas the very great expense of obtaining Letters Patent for the protection of an Invention or Discovery, according to the existing routine of Offices and Stamp Duties, being such as to operate severely upon the industry and ingenuity of the Country; BE it Enacted, That the Fees payable at the Offices of the Secretary of State, the Attorney-General or Solicitor-General, the Signet Office, the Privy Seal Office, and the Great Seal Office, shall be and the same is hereby reduced to the sum of Sixty pounds; when the Letters Patent are granted for the term of *Fourteen* Years, and that the said Expenses shall be reduced to the sum of Thirty pounds, when the Letters Patent are granted for the term of *Seven* Years; and that the Stamp Duties upon the same be reduced accordingly, and included in those sums.

To extend to Scotland and Ireland.

AND whereas the Costs and Expenses of obtaining Letters Patent are unnecessarily increased when taken out for Scotland and Ireland by the Patentee of an Invention for England; BE it further Enacted, That an Inventor who has obtained Letters Patent for England may have Certificates of the grant of the same, which shall be lodged with the Attorney-General or Solicitor-General for Ireland, or the Lord Advocate for Scotland; and if no Caveats are entered or opposition made, then the said Attorney-General or Solicitor-General for Ireland, or the Lord

Advocate for Scotland, may at the end of *Fifteen* Days from the depositing of the Petition, report the same, and make out the Bill in the usual manner for the grant of Letters Patent in Scotland or Ireland, but the Sign Manual of his Majesty is hereby dispensed with as far as it has been required in the granting such Letters Patent for Scotland or Ireland. And the Seal appointed by the Treaty of Union in Scotland and the Great Seal of Ireland shall be forthwith appended to the said Letters Patent, the whole charge of fees and stamps for the same in each country respectively not exceeding £20.

To deposit a Specification of Particulars.

AND whereas the grant of Letters Patent, giving an exclusive monopoly to the Patentee, his Heirs, or Assigns, to make, exercise, and vend the said Invention for a limited Term of Years, it is expedient that, after the expiration of the said Term, the Public should have the benefit of the Invention or Discovery, with full liberty to make, exercise, and vend the same: BE it therefore Enacted, That the grant of such Letters Patent shall contain a Proviso that the Patentee shall prepare, or cause to be prepared, an Instrument in Writing, (accompanied with Drawings, if necessary,) containing a full and particular Description of the said Invention or Discovery, and of all things claimed and intended to be secured by the said Letters Patent, and in what manner the same is to be performed, to the best of his knowledge and belief; AND that he, the Patentee, or his Representative, by Power of Attorney duly authorised, or his Executors or Administrators, in case of Death, shall sign, seal, and deliver the said Instrument as the Specification of the said Invention or Discovery, before Two credible attesting Witnesses, and cause the same to be deposited for Enrolment with the proper Officer appointed to receive the same, by the Attorney-General or Solicitor-General, within the Term of   Calendar Months, as directed in the said Proviso; and in default of compliance with the said Proviso, the said Letters Patent shall cease, determine, and become void.

The Specification to be examined and certified.

AND be it further Enacted, that such Specification shall be examined by the Attorney-General, or Solicitor-General and his Board of Advisers, and if in their Opinion found not to accord with the preparatory Specification, or not to be sufficiently explanatory, the Patentee, or his Representative, shall be forthwith called upon to attend the Board, and explain, or deliver, within Fifteen Days from the Summons, such further Information as may be required, or, in Default of which, to abide by the Consequences of such want of Accordance, or Insufficiency; and when the same shall be found to accord with the preparatory Specification, and to comply in all particulars with the Proviso in the Grant, and not otherwise, the same shall be approved and certified by the Members of the Board, by whom it has been examined, and by the Attorney-General or Solicitor-General, as a good and sufficient Specification of the said Invention or Discovery, and of all things claimed under the said Patent, and that the sufficiency of the said Specification (if so certified) shall not be afterwards questioned in any Court of Law or Equity. And that the said preparatory Specification and ultimate Specification, whether so certified or not, shall be appended together, and by the proper Officer of the Attorney-General or Solicitor-General shall be Inrolled in Chancery within one Calendar Month from the date of depositing such ultimate Specification for Examination, and shall then and there be open to public inspection as other Records usually are, and that the Patentee, or his Representative, shall be called upon to pay the sum of five guineas for every such Examination or Hearing before the Attorney-General or Solicitor-General, before the Certificate is given, and that he shall be liable in law for the customary costs and charges of Inrolling the same in Chancery.

To deposit a Model if necessary.

AND whereas there is often great difficulty in giving a full Description of an Invention, by which it can be readily performed or made either by a written Account or Drawings thereof: BE it further Enacted, that it shall be lawful for the Patentee, in addition to his written Description and Drawings, to deposit a Model or Pattern of his Invention, if he shall see fit, in some Public Building, within a stated time, to be named by the Attorney-General in his Report or Bill, and that the said Model or Pattern may be produced or given in evidence by any person whatever in any Court of Law or Equity.

To correct Specification, and insert Improvements.

AND whereas it often happens that Omissions are accidentally or unintentionally made in the Specification of an invention: AND whereas it often happens that the Patentee discovers some improvement upon the subject for which the Letters Patent have been granted, and he is deterred by the great expense thereof from taking out new Letters Patent for the said Improvement, which is often lost to the Public; BE it Enacted, That it shall be lawful for the said Patentee to make a Specification or Specifications supplying those Omissions or including those Improvements, which, by Petition to the King, shall be referred to the Attorney-General, or Solicitor-General and his Board of Advisers, to try them, examined in the same way, and subjected to the same conditions as the first Petition; and if in the Judgment of the Attorney-General or Solicitor-General and their Board of Advisers, the said Specification shall appear to accord with the general features, and to form a necessary part of the subject described in the former Specifications, and provided that no similar Invention be claimed under a Caveat, the Members of the Consulting Board and the Attorney-General or Solicitor-General shall certify their approval of the same, and order that the Specification be inrolled within one month from the time of depositing the Petition, and that the Invention described in the same do form part of the original Letters Patent, and be subject to the like conditions, the costs of which examination and inrolment are to be paid as before directed.

Assignment of Interest.

AND whereas the Property in Letters Patent is unnecessarily abridged, without any corresponding advantage to the Public: BE it Enacted, that the Person or Persons to whom Letters Patent may have been granted, shall be at liberty to assign or transfer his or their interest in Letters Patent, or grant Licenses to make or use the same in and manner or to any number of persons he or they may think best for his or their own advantage.

Extension of the Grant.

AND whereas it sometimes happens that Patentees do not derive an adequate Profit from their Inventions during the Fourteen Years for which the Letters Patent have been granted: AND whereas there is no remedy but by an Act of Parliament, to enlarge the Term for which they were granted: BE it Enacted, That at any time exceeding one year before the Term is expired, the Patentee, or his Assigns, may, upon showing that he or they have not been enabled fully to carry the same Invention into effect, or to derive a reasonable Profit from the same, obtain by Petition a Patent to extend the Term; and His Majesty is hereby authorized and empowered to grant Letters Patent of Extension, in the same manner as other Letters Patent for Inventions are to be granted; but the Attorney-General shall, with the assistance of the Examiners aforesaid, report upon the fitness thereof, and the terms upon which they ought to be granted, and all costs and expenses of making the necessary Report shall be paid and discharged by the Persons obtaining the said Letters Patent for an extension of the Term.

Injunction to stay a Piracy.

AND whereas great Delay, Inconvenience, and Expense have arisen in consequence of a Patentee being often obliged to sue in a Court of Equity, whilst he has a Suit depending in a Court of

Common Law: BE it Enacted, That the Plaintiff to a Suit in a Common Law Court may, by Motion in that Court, or from a Judge thereof, obtain an Order to stay the Defendant from making or using the Invention, unless an account be kept of the sale or use thereof, and also may obtain an Order to inspect the thing supposed to be a piracy of the Invention.

To change the Venue in Suit.

AND be it further Enacted, That the Venue in any Action may be changed, on Motion to the Court, to the County in which the Witnesses reside, upon both parties approving the same.

To Summons competent Juries.

AND be it further Enacted, That either Party may obtain an Order of the Court, that the Sheriff do return, amongst the Special Jurors to serve on the Trial, Twelve Men practically skilled in the Arts and Sciences, and that each Party shall be at liberty to challenge *Six* of them; and either Party may obtain an Order that the said Jurors may examine the Drawings and Models at least *Two* days before the day of the Trial

Assessment of Damages.

AND be it further Enacted, That every Defendant against whom a Verdict shall pass for the Infringement of a Patent, shall pay *Three* times the amount of the Damages suffered by the Patentee, as it may appear by the proofs of the Patentee, or by the Account rendered as aforesaid by the Infringer.

Cancelling Letters Patent

AND whereas Actions at Law may be brought upon Letters Patent after the Patentee has been unsuccessful in one Action, and has had a Verdict recorded against him: AND whereas the present mode of Cancelling Letters Patent for Inventions by Scire

Facias is dilatory and expensive; BE it Enacted, That if the Defendant in an Action on Letters Patent obtain a Verdict, which is not set aside by the Court in which the Action be depending, then the Defendant shall be at liberty to apply to the said Court for a Certificate, that the said Letters Patent ought to be cancelled; and the said Court is hereby empowered, on Motion to them made, if they think fit so to do, to grant a Certificate that the same ought to be cancelled, and the said Defendant may take the said Certificate to the Lord Chancellor, to whom it shall be a sufficient authority that the said Letters Patent be by him cancelled.

When this Act to come into force.

AND be it further Enacted, That this Act shall come into force and take effect, as to the mode of obtaining Letters Patent, from the *First day of November in the year of our Lord One thousand eight hundred and thirty-three*; and that all the provisions therein contained, shall, as far as they can, apply to all Letters Patent then in force, as well as to all Letters Patent then and thereafter to be granted.

To extend to Scotland and Ireland.

AND be it further Enacted, That this Act shall extend to Scotland and Ireland.

LITERARY NOTICES.

Tables for planting and valuing Underwood and Woodland, &c. &c. By Mr. R. Horton. 12mo. London: Longman and Co.

We have recently had the pleasure of perusing some very useful tables on the planting and valuing of underwood and woodland, or growing timber, drawn up by Mr. Richard Horton, who we belive is a practical surveyor. Such tables have long been wanting, as considerable difficulty has hitherto arisen in ascertaining the number of seeds, plants, or trees, required to cover a given quantity of land, and also to form a fair and correct estimate, or valuation of growing underwood, or young timber.

To the land steward, surveyor, planter, or land owner these tables must prove of great assistance, as at one view he can find how many seeds, plants, or trees it will take to cover any given quantity of land, at any required distance between each plant; also, by these tables can be seen the estimated value of growing underwood of any age, with or without regard to the price it sold for at the last falling.

In this little work Mr. Horton has also added some other useful tables, particularly for converting customary meadow into statute, or from one denomination to another.

New Patents

SEALED IN ENGLAND.

1833

To Henry William Nunn, of the parish of Whippingham, in the Isle of Wight, bobbin net lace manufacturer; George Mowbray, of the same place; and Richard Alabone, of the town of Newport, in the said Isle of Wight, foreman to the said Henry William Nunn, for their invention of certain improvements in the machinery used in the manufacture of bobbin net lace, for producing certain kinds of embroidered or ornamented lace.—Sealed 27th February—to be inrolled within 6 months.

To Charles Jones, of Birmingham, in the county of Warwick, gun-maker, for an invention of certain improvements upon percussion locks applicable to fire arms.—Sealed 7th March—6 months for inrolment.

To John Springall, of Oulton, in the county of Suffolk, iron-founder, for his invention of an improved corn stack stand.—Sealed 7th March—2 months for inrolment.

To Thomas Don, of Lower James-street, Golden-square, in the city of Westminster, millwright and engineer, for certain improvements in machinery for the preparation of farinaceous substances, and in the processes of making bread, portion of which improvements were communicated to him by a foreigner residing abroad. —Sealed 8th March—6 months for inrolment.

To William Henson, of the city of Worcester, lace manufacturer, for his invention of certain improvements in machinery for manufacturing lace, commonly called bobbin net lace—Sealed 14th March—6 months for inrolment.

To Miles Berry, of 66, Chancery-lane, in the county of Middlesex, mechanical draftsman, and patent agent, for an improvement or improvements in the making or constructing of gas meters, being a communication from a foreigner residing abroad—Sealed 19th March—6 months for inrolment.

To William Herbert, of Nottingham Park, in the county of Nottingham, lace manufacturer, for his invention of certain improvements applicable to that class of machinery commonly called or known by the name of warp machinery, employed for the manufacture of lace and other fabrics—Sealed 21st March—6 months for inrolment

CELESTIAL PHENOMENA, FOR APRIL, 1833.

D.	H.	M.	
1	0	0	Clock before the Sun 3 m. 58 s.
	—		Sun rises 5 h. 38 m. sets 6 h. 31.
	—		Moon rises 2 h. 22 m. p.m. sets 4 h. 35 m. A. M.
	—		Moon passes the meridian 9h. 48 m.
	4	0	Sun in conj. with Jupiter.
	19	0	Moon in perigee.
2	15	50	☽ in conj. with ♄ long. 173. ☾ lat. 4.55. N. ♄ lat. 2. 28. N. diff. of lat. 2. 27.
4	2	40	Ecliptic opposition or ○ full moon.
5	0	0	☿ Stationary.
	—		Clock before the Sun 2 m. 46 s.
	—		⊙ rises 5 h. 29 m. sets 6 h. 38 m.
	—		☽ rises 7 h. 51 m. P. M. sets 6 h. 17 m. A. M.
	—		☽ passes the mer. 13 h. 19 m.
7	0	0	Mer. R. A. 1 h. 48 m. dec. 14. 34. N.
	—		Ven. R. A. 3 h. 40 m. dec. 24. 53. N.
	—		Mars R. A. 5 h. 59 m. dec. 25. 16. N.
	—		Jup. R. A. 0 h. 50 m. dec. 4. 11. N.
	—		Sat. R. A. 11 h. 38 m. dec. 5. 8 N.
	—		Georg. R. A. 21 h. 37 m. dec. 14. 59. S.
	—		Vesta R. A. 18 h 56. m. dec. 18. 54. S.
	—		Juno R. A. 15 h. 33 m. dec. 4. 56 S.
	—		Pallas R. A. 2 h. 5 m. dec. 5. 22. S.
	—		Ceres R. A. 3 h. 44 m. dec. 18. 28. N.
10	0	0	Clock before the ⊙ 1 m. 20 s.
	—		⊙ rises 5 h. 18 m. sets 6h. 46 m.
	—		☽ rises 0 h. 41 m. A. M. sets 8 h. 51 m. A. M.
	—		☽ passes mer. 17 h. 36 m.
12	0	7	☽ in □ or last quarter.
13	2	26	♀ passes the meridian
13	13	0	☿ passes the meridian.
13	15	0	☽ in Apogee.
14	0	0	half Axes } 44. 46. Jupiter's ring } 0. 26.
15	0	0	Clock before the ⊙ 0 m. 1 sec.
	—		⊙ rises 5 h. 7 m. sets 6 h. 54 m.
	—		☽ rises 3 h. 58 m. A. M. sets 1 h. 43 m. P. M.
	—		☽ passes the meridian 21h. 30m
	16	0	○ in conj. with ☿
18	11	41	☽ in conj. with ♃ long. 15. ☽ lat. 5. 0. S. Jupiter lat. 1. 5. S. diff. of lat. 6. 5.
19	2	9	☽ in conj. with ☿ long. 23. ☽ lat. 5. 0. S. ☿ lat. 0. 57. N. diff. of lat. 5. 57.
19	20	29	⊙ enters Taurus.
20	0	0	Clock after the ⊙ 1 m. 8 s.
	—		⊙ rises 4h. 56m. sets 7 h. 3 m.
	—		☽ rises 5h. 39 m. A. M. sets 7 h. 28 m. P. M.
	—		☽ passes mer. 0 h. 27 m.
	1	4	Ecliptic conj. or ● new moon.
21	19	40	Georg. passes the meridian.
22	4	40	☽ in conj. with ♀ long. 64. ☽ lat. 3. 39. S. ♀ lat. 5. 39. N. diff. lat. 9. 18.
23	0	0	Mer. R. A. 1 h. 19 m. dec. 8. 8. N.
	—		Venus R. A. 4 h. 4 m. dec. 26. 34. N.
	—		Mars R. A. 6 h. 39 m. dec. 24. 52. N.
	—		Jupiter R. A. 1 h. 3 m. dec. 5. 34. N.
	—		Saturn R. A. 11 h. 35 m. dec. 5. 24. N.
	—		Georg. R. A. 21 h. 39 m. dec. 14. 49. S.
	—		Vesta R. A. 19 h. 13 m. dec. 18. 45. S.
	—		Juno R. A. 15 h. 23 m. dec. 3. 15. S.
	—		Pallas R. A. 2 h. 33 m. dec. 3. 56. S.
	—		Ceres R. A. 4 h. 9 m. dec. 20. 17. N.
24	19	18	☽ in conj. with ♂ long. 99. ☽ lat. 28 S. ♂ lat. 41 N. diff. lat. 2. 9.
25	0	0	♀ Stationary.
	—		Clock after the ⊙ 2 m. 8 sec.
	—		⊙ rises 4h. 46m. sets 7 h. 11 m.
	—		☽ rises 8 h. 32 m. A. M. sets 0 h. 15 m. A. M.
	4	33	♂ passes the meridian.
	22	52	♃ passes the meridian.
27	5	34	☽ in □ or first quarter.
29	0	0	☿ Stationary.
29	21	0	☽ in conj. with ♄ long. 172. ☽ lat. 4. 31. N. ♃ lat. 2. 25. N. diff. of lat. 2. 6.
30	0	0	Half Axes } 43. 59.
	—		Jupiter's ring } 0. 0.

Eclipses of Jupiter's Satellites are not visible this month.

J. LEWTHWAITE. Rotherhithe.

METEOROLOGICAL JOURNAL,

FOR FEBRUARY AND MARCH, 1833.

1833.	Thermo.		Barometer.		Rain in inches.	1833.	Thermo.		Barometer.		Rain in inches.
	Hig.	Low	Hig.	Low.			Hig.	Low	Hig.	Low.	
Feb.						March.					
26	50	33	29,34	29,24	,15	12	41	28	29,94	29,87	
27	47	36	29,12	29,06	,05	13	39	23	29,78	29,48	
28	45	27	29,29	28,85	,025	14	39	18	29,68	29,54	
March.											
1	45	29	29,26	29,04	,15	15	40	26	29,60	29,52	
2	40	29	29,74	29,61		16	49	27	29,50	29,46	
3	53	31	29,68	29,64		17	48	29	29,54	29,46	
4	53	39	29,74	29,64		18	42	32	29,73	29,56	,125
5	51	27	29,98	29,86		19	42	31	29,93	29,81	,275
6	43	37	30,04	30,00	,025	20	43	26	30,06	30,00	
7	45	30	30,19	30,09		21	42	29	29,97	29,85	
8	38	26	30,20	Staty.		22	39	25	29,89	29,80	
9	39	26	30,17	30,06		23	39	24	29,80	29,74	
10	39	30	29,91	29,87		24	40	27	29,78	29,72	
11	43	29	29,95	29,91		25	43	29	29,79	29,74	,025

The Annual Meteorological Tables will appear next Month.

Edmonton. CHARLES HENRY ADAMS.

Latitude 51° 37 32 N.
Longitude 3 51 West of Greenwich.

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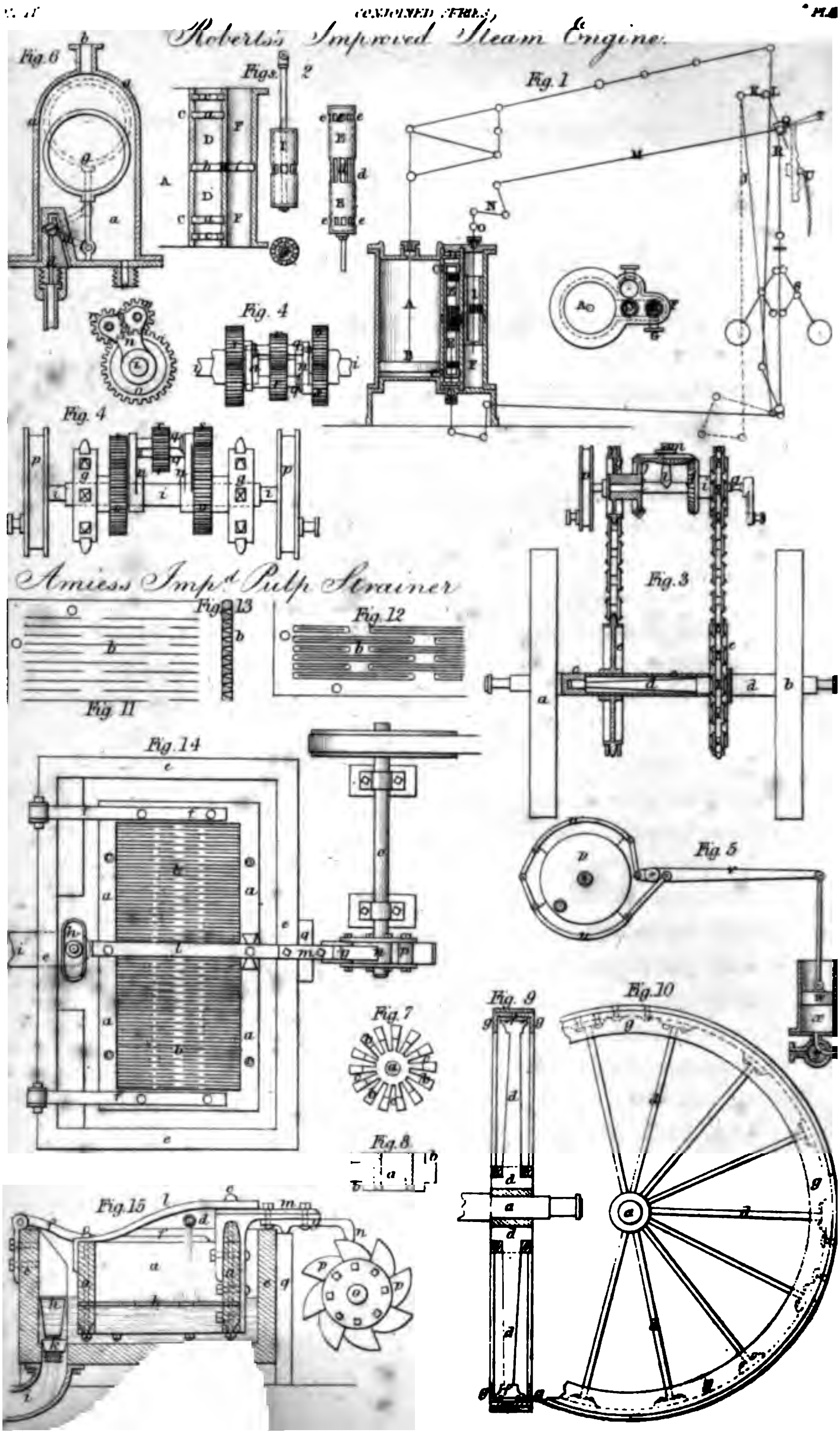

Roberts's Improved Steam Engine.
Fig. 6
Figs. 2
Fig. 1
Fig. 4
Fig. 4
Fig. 3
Amies's Impd Pulp Strainer
Fig. 13
Fig. 12
Fig. 11
Fig. 14
Fig. 5
Fig. 7
Fig. 8
Fig. 9
Fig. 10
Fig. 15

May 1st 1833

THE

London

JOURNAL OF ARTS AND SCIENCES,

AND

REPERTORY

OF

PATENT INVENTIONS.

No. XIII.

CONJOINED SERIES.

Recent Patents.

To Richard Roberts, *of Manchester, in the county of Lancaster, civil engineer, for his invention of a certain improvement or certain improvements in steam engines, and also in the mechanism through which the elastic force of steam is made to give impulse, and to regulate the speed of locomotive carriages.*—[Sealed 13th April, 1832.]

SPECIFICATION.

My invention of a certain improvement or certain improvements in steam engines, and also in the mechanism through which the elastic force of steam is made to give impulse to, and to regulate the speed of, locomotive carriages, is fully described and set forth in the manner following; and is further illustrated and exemplified by the several figs. in Plate X; the scale of the several parts are marked upon the sheet of drawings accompanying the Specification. Machines of the kind to which my present improvements apply, being of very different magnitudes, the several parts which I describe may be required to deviate considerably from the sizes indicated by the scales which I have used. The parts which I now describe as applicable to steam engines, I consider to be of appropriate dimensions, for a cylinder of twelve inches diameter and of sixteen inches stroke. In the figures the same parts are indicated by the same letters. My improvement or improvements in steam engines consists or consist of a new form and arrangement of the working valves, which allow of the entrance and escape of the steam to and from the working cylinder. The construction and mode of action and application of my improved valves are ascertained and shown by the following description; reference being had to the accompanying drawings in illustration of the same. Instead of the sliding flat valves, or D, valves, which have been in common use in steam engines, the valves which I have invented, and am about to describe, are hollow metallic cylinders, fitting steam tight into accurately bored cylindrical cavities, within which they can be made to move longitudinally in the direction of their axes by means of valve rods attached to them, which pass through stuffing boxes in the lids of the containing cylinders.

I describe my improved valves and their containing cases as cylindrical in form, because it is more easy in practice to make them with the requisite accuracy of that form [illegible] prismatic shape; yet if it were thought [illegible] might be adapted as the form to be given to these valves. In the apparatus about to be described, I call the inner hollow cylinder or prism the valve; the outer case in which it moves, I call the valve cylinder, or valve case. One of the improvements contemplated in the invention for which the present Patent has been obtained, is a more easy and certain mode than has heretofore been used of cutting off the supply of steam from the working cylinder, at any assignable and changeable point in the stroke of the engine.

To effect this object I employ a series of two valves, somewhat differently modified, through which the steam passes consecutively. Under this arrangement I call the valve nearest in course to the boiler, the induction valve; the other, which is nearest to the working cylinder, I name the work valve. Where it is not designed to vary the time of cutting off the steam during the working of the engine, one of these valves, as is the case with other forms of valves, will suffice. This will be the one which I call the work valve. The forms, application, and mode of action of the valve and their adjuncts, will be understood by reference to figs. 1, and 2, in the sheet of drawings, aided by the description which follows:—

Fig. 1, A, shows the working cylinder of a steam engine, of which B, is the piston; C, C, are the steam ways into the cylinder; D, is the work valve cylinder, either cast in one piece with the working cylinder, or attached to it by bolts or other fastenings. One end of this cylindrical cavity is closed by a solid cap, the other by a lid or gland having a stuffing box, through which the valve rod works steam tight. By the steam ways C, C, the cavities of the working cylinder, and of the work valve cylinder, communicate. In the situation of the steam ways C, C, annular chambers are cast or cut in the internal surface of the valve cylinder, corresponding with the dimensions of the steam ways in their longitudinal admeasurement, and being in depth from a quarter to half an inch.

Sections of these chambers are seen at *a, a, a, a,* fig. 2. Another annular chamber *b, b,* fig. 2, similar to the above, is made at the middle of the length of the cylinder; from which passes another steam way H, into the induction valve cylinder. Fig. 2, *c, c,* are two other steam ways and their annular chambers near to the ends of the cylinder, for the eduction of the spent steam E. Figs. 1, and 2, is the work valve; a hollow cylinder, which I prefer to be of wrought iron, closed at both ends, to one of which is fixed the valve rod, by which it can be moved in the direction of the axis of the cylinder. The valve must be so much shorter than the inner length of the valve cylinder, as will allow of its due action to close and open alternately, the working cylinder steam ways corresponding in situation with the annular chamber *b, b,* when the valve is at half stroke, that is, midway in the cylinder; the valve is pierced with a number of longitudinal slits *d, d,* or otherwise perforated, so as to admit the passage of steam.

The apertures *d, d,* in the valve corresponding with the chamber *b, b,* must be so far elongated in the direction of the axes of the cylinder as at all times of the stroke to be quite open through the chamber *b,* to the induction valve steam way. The valve is similarly perforated in two other places, so that when it is at half stroke, these apertures *e, e, e, e,* fall a little within the situations of the two aunular chambers *a, a, a, a,* being then covered by the touching surface of the valve cylinder, as seen in fig. 1. When the valve is in the position of half stroke, the imperforated portions of it towards the ends beyond the apertures *e, e, e, e,* should over-lap the annular chambers *a, a, a, a,* on each side from one-eighth to one fourth of an inch. In this position of the valve, both steam ways into the working cylinder are closed; but the steam ways into the eduction pipe then and in all other moments of action remain unobstructed by the position of the work valve.

The valve and its case must be so fitted to each other, as to allow the valve to move steam tight for some distance on each side of the annular chambers, *a*, and *b*; F, is the induction valve cylinder or case, closely contiguous to the work valve cylinder; either cast in the same piece or fastened to it. This cylinder has a steam way G, for the introduction of steam from the boiler; and the steam way H, which connects its cavity with that of the work valve cylinder, corresponding with the steam way H, the cylinder has an annular chamber *f*, *f*, such as have been described in the other valve cylinder I; the induction valve is also a hollow metallic cylinder or prism, moveable steam tight in its case, by means of a valve rod passing through a stuffing box at one end of the cylinder or case, the other end of which has a close cap. The induction valve is open at both ends; the valve rod being attached to it either by a perforated cap, or by cross arms *g*, which will allow the free passage of steam.

The induction valve is perforated about its middle, as is the work valve; the openings corresponding in extent with the breadth of the annular chamber *f*, *f*. The work valve being designed to govern the admission and escape of steam, alternately through the steam ways of the working cylinder, has its movements governed through its valve rod in the same way as the work valves of other forms which are intended to admit steam to the cylinder during the whole of each stroke. The motion may be taken as is usual from an eccentric on the fly wheel or other shaft, and communicated through levers and connecting rods or links, as is shown by the lines in fig. 1. The induction valve is that which I employ to regulate the duration of the supply of steam from the boiler, during each stroke of the engine. The induction valve is worked by a system of levers and rods, analogous to that in common use for the working of valves, as is shown in fig. 1; but my present invention, as relates to the working of the valves, consists in having devised ready means for changing at any moment of the action or rest of the engine, the relative lengths of the intervening lever arms, so as to change correspondently the times of the ultimate action.

The particular arrangement of these working parts may vary with the form, situation, and other variable circumstances of steam engines. The means by which I find it convenient to accomplish this alteration of lengths are as follows:—From the same eccentric which works the levers and rods of the work valve, or from another on the same, or another shaft, as may be most convenient, a rod J, passes to a bent lever as at K, which is moveable on the fixed centre L; M, another rod, connects the opposite arm of the bent lever K, with N; another bent lever, the opposite arm of which is connected by the intervention of O, a link with the induction valve rod. In this system of levers the length of one arm of the bent lever K, is made variable at pleasure, or according to the changeable velocity of the engine. The arm of the bent lever K, with which the rod M, is in connexion, is curved into a segment of a circle described with the radius M, from its opposite extremity as a centre, when the valve is at half stroke.

On the curved arm of the bent lever *k*, is a sliding socket Q, with which the end of the rod M, is jointed. The slider Q, is also connected by means of an adjustable rod R, with the governor of the engine S. With a given density of steam, and an uniform resistance, the speed of an engine will be governed by the time during which the steam is allowed to flow through the induction pipe, in the period of each stroke. The longer the time during these periods that the steam acts with its full pressure on the piston, the more accelerated will be the speed of the engine, up to the rate at which it can be driven by the steam acting with its full force for the whole duration of every stroke. But it is commonly advantageous that a steam engine should not be constantly wrought to the fullest capability of its power. It is highly important that the same engine should be adaptable, by easy means, to the performance of very different quantities of work.

The most obvious means of effecting this adjustment of power to the variable calls for its employment, is by measuring out the quantity of motive force delivered to the engine from the boiler. Supposing the steam to continue to be generated of nearly uniform density, the quantity of imparted force will be measured by the length of the intervals of time during which the steam flows uninterruptedly from the boiler into the working cylinder. For the perfect regulation of these intervals of steam supply, it is necessary to possess the power of cutting off the steam at any moment of the stroke, leaving the subsequent action to the expansive force of the portion of steam already admitted.

My present invention gives the power of adjusting at will, or according to variable circumstances, the moment of cutting off the supply of steam from the boiler, by making one arm of an intervening lever in the working gear of the induction valve changeable at any moment. The slider Q, which by its situation on the curved arm of the bent lever K, determines the effective length of that arm, can be shifted at any moment, either by hand or by the action of the governor. In this way the governor regulates the speed of the engine, by varying the moment of cutting off, instead of adjusting the supply of steam by a throttle valve.

The mode by which the slider Q, is moved by the governor, will be seen by reference to fig. 1. In engines not having a governor, as those used for locomotion, the slider Q, can be shifted at pleasure by the engineer during the action of the engine, by means of a projecting handle or rod, as shown at T, the slider being held in its assigned place by a rack and spring, as seen at U, or by any other suitable means.

The induction valve makes a single stroke by a half revolution of the eccentric which works it, consequently whether those strokes be long or short, they are each performed in an equal interval of the engine's general action. According then to the length of range of stroke of the induction valve, the steam way into the work valve cylinder is kept open a longer or shorter portion of the whole duration of each stroke. Now, the extent of range of the induction valve is governed under the arrangement now described, by the variable length of the curved arm of the bent lever K, the range of the valve being extended as that arm is lengthened. The proportion then betwixt the axual extension of the steam passages and the longitudinal range of the valve, determines the relative times of free and closed passage for the steam.

If the valve move through somewhat less than twice the axual extension of the steam way, the passage for the flow of steam will never be cut off; if a longer stroke be made by the valve, it will close the steam way during the latter portion of the stroke of the piston; and if the range be further increased, the steam way will be closed during a proportionately longer portion of the stroke. It is desirable to make the adjustment such that the valve will cut off at one one-eight or one-sixth of the stroke by its longest action, and keep the steam way constantly open by its shortest. I find that if the shortest action of the valve be made about one and a half times the axual length of the steam way, and the longest about five times, the variability is sufficiently great.

In the common working valve the action of the eccentric is about one-fourth later in time than the engine crank. In my present arrangement the eccentric for the induction valve is about one-third later than the crank. The induction valve must be so adjusted as to be just commencing to open the steam way H, as the piston is finishing its stroke.

Another part of my present invention of improvements in steam engines is a self-acting regulator for maintaining in the boiler the proper quantity of water, by stopping the supply from the force pump *p*, whenever the water reaches a certain level. My contrivance for this purpose is represented at figure 6; *a*, is a steam tight vessel, which by a pipe from the aperture *b*, communicates freely with the upper part of the boiler; and by another pipe from the opening *c*, communicates with the lower part of the boiler; *d*, is a syphon passage through the piece of metal at the bottom of the vessel, in the course of which is a stop cock *e*, which serves for a passage of communication betwixt the external air and the cavity of the force pump below the plunger or bucket.

The lever *f*, of the stop cock is connected with the stem of a hollow metallic float, marked *g*. The regulating apparatus should be so placed in reference to the water line in the boiler, as that the float may open the passage of the stop cock *e*, when the water has acquired the proper level, and close it again by falling, as the water in the boiler becomes exhausted by evaporation.

One object of my present improvements in the mechanism through which the elastic force of steam is made to give impulse to, and to regulate the speed of locomotive carriages, is to allow a difference of rotatory velocity in the bearing wheels of a locomotive carriage, whilst both such wheels are being driven by a motive power common to them both.

The mode or modes by which I accomplish this object will be understood by reference to the figures, and by the following description :—*a*, and *b*, fig. 3, show the driving wheels of a locomotive carriage, which are staked on the ends of *c*, *d*, the axle, which consists of two distinct parts, one of which *c*, is hollow to a certain distance from its inner extremity, that is, the end betwixt the wheels, in order that it may receive, as in a socket, the reduced inner extremity of the other part of the axle *d*, and allow it to turn therein. A neck is turned down near the outer extremity of each portion of the axle, to be received in metal bearings connected with the frame work of the carriage.

On the separate parts of the axle within the bearing wheels, two chain wheels *e*, *e*, (or they may be pulleys) are keyed, in order to connect the axle by endless chains (or straps) with two similar chain wheels *g*, *g*, (or pulleys) on a driving shaft *i*, which is either cranked at both ends, or has keyed thereon discs with crank pins, which are set at right angles to one another. The chain wheels *g*, *g*, (or pulleys, if such be used) are firmly connected with two bevel wheels *j*, *j*, which, along with the chain wheels, can turn freely on the crank shaft *i*.

The bevel wheels *j*, *j*, are retained in their proper places on the shaft, by keys and washers. From the middle of the crank shaft a fixed arm *l*, projects at right angles, and on a turned bearing at its end, carries another bevel wheel *m*, loose thereon, and gearing into the two bevel wheels *j*, *j*. The wheel *m*, is secured in its place by a key, and washer, and shoulder. When the crank shaft is driven by the moving power, the wheel *m*, on the projecting arm *l*, becomes a carrier to both the wheels *j*, *j*, and causes them, along with the attached chain wheels, to revolve simultaneously and in the same direction with the crank shaft; and so long as the track of the carriage is in a right line, they all move with the same angular velocity.

But when the carriage moves in a curve line, the outer carriage wheel requiring more motion than the inner one, the bevel wheel *m*, by the difference of resistance on its two sides, turns a little on its bearing, and in consequence allows a proportionately greater quantity of motion to the outer than to the inner bevel wheel, causing the one to turn a little forward; the other in the same degree backward on their respective bearings on the crank shaft. Another modification of mechanism for effecting the accommodation of the bearing wheels to a curvilinear path of the carriage, is shown at fig. 4 : *i*, is the crank shaft, having at its ends the engine cranks set at right angles to each other, as in the case before described; *o*, *o*, are two spur wheels firmly connected with two chain wheels (or pulleys) *g*, *g*, and turning loose on the crank shaft *i*.

Upon the crank shaft *i*, within the wheels *o*, *o*, are keyed two flat pieces of metal or framing plates *n*, *n*, projecting at right angles from the shaft, and having bearings near the outer margins to carry two short shafts *q*, *q*, on which are keyed, betwixt the plates, two other pinions *r*, *r*, which gear with one another, and on án end of each shaft, projecting on opposite sides beyond the plates, two other pinions *s*, *s*, which gear respectively into the two spur wheels *o*, *o*.

The crank shaft *i*, being driven by the engines, carries round with it the framing plates *n*, *n*, and consequently the shafts *q*, *q*, and pinions *r*, *r*. Under these circumstances the pinions *s*, *s*, carry round the spur wheels *o*, *o*, at the same rate that the crank shaft revolves, whilst the carriage progresses in a right line.

When the carriage makes a turn, and thereby calls for a difference of rotatory velocity in the bearing wheels *a*, *b*, a corresponding difference of motion is effected in the wheels *o*, *o*, the one being made to advance a little on the rotatory movement of the crank shaft; the other to retard in an unequal degree, by the turning a little of the two pinions *s*, *s*, on their centres, in opposite directions.

For controlling more effectually the motions of the carriage, it is expedient, in place of one or both cranks at the ends of the crank shaft, which is immediately driven by the engines, to key on a friction disc or discs, carrying crank pins on the face or faces. I prefer to employ two discs, instead of cranks, as is shown in fig. 4, *p*, *p*. To the peripheries of these discs, brakes are adapted to produce friction when necessary.

The long arm of one of these brakes I leave to be acted on in the ordinary way by the power of the engineer, or of the conductor. The extremity of the lever of the other brake I connect with the piston of a steam cylinder, in such way that on the admission of steam into the cylinder, the rising of the piston shall cause the brake to act upon the friction disc; *p*, fig. 5, is one of the friction discs or pulleys on the crank shaft; *u*, is the brake; *v*, the brake lever, the longer arm of which is connected with the piston *w*, of the steam cylinder *x*, which is open at top. The steam cock *y*, must be placed under the controul of the conductor, and is to be so constructed as when the steam is tur[illegible] passage is opened betwixt the cavity of the cylinder beneath the piston and the external air for the escape of the steam. The friction thus produced by the action of the piston on the brake lever, may be graduated by regulating the quantity of steam admitted into the cylinder, and by these means retardation may be adjusted to the variable necessity of circumstances.

Another of my present improvements in the mechanism through which the elastic force of steam is made to give impulse to locomotive carriages, consists in a new mode of constructing the bearing wheels of such carriages, so that they may have sufficient strength and solidity to support efficiently the load and strains to which wheels of carriages, impelled by the elastic force of steam, or by any other adequate portable power, are of necessity subjected.

My wheels for these purposes are constructed in the following manner:—

Figs. 7 and 8, show the boss or nave of cast iron; fig. 7, a side view; and fig. 8, a section; *a*, the central hole for the axle. The body of the nave is cylindrical, having a rabbet at each end, *b*, *b*, *b*, *b*, to receive hoops; the rabbets are a little taper towards the middle of the nave, to hold the hoops in their places. In the direction of the axis of the nave there are grooves for the reception of the inner ends of the spokes, going to some depth below the nearly cylindrical surfaces of the rabbets (see *c*, *c*, *c*). The spokes I make of wrought iron, of the form seen in figs. 9 and 10, which are a section and partial view of a wheel; *d*, *d*, are the spokes, the inner ends of which are fitted accurately to the grooves of the nave, the shouldered portions of them filling those parts of the grooves which are within the cylindrical surfaces of the rabbets.

For the purpose of holding firmly the spokes in their sockets in the nave, a wrought iron or other metal hoop (in section at *e*, *e*, *e*, *e*,) accurately turned, is let on the rabbet at each end of the nave over the projecting shoulders of the spokes. The inner surfaces of the hoops are conical, a little contracting on their inner sides, corresponding with the taper of the rabbets, so that when let on hot, they pass over the larger diameter of the rabbet, and when contracted by cooling, they are retained securely in their places. The outer ends of the spokes are spread out in both directions, as at *f*, *f*; the extreme surface of these plate heads, in the direction of the plane of the wheeel, being a curve correspondent with the circle thereof. The rim of the wheel is formed of two rings of wrought angle iron, as seen in sections at *g*, *g*, *g*, *g*, which are rivetted to the plate heads of the spokes, as shown in the figs. The tire is a hoop of wrought iron put on hot, and rivetted to each of the angle iron rings, at proper distances between the spokes.

I claim the rights and privileges conferred on me by the present Letters Patent, for the construction, use, application, and sale, by myself, or by others taking legal right from or under me for the same (as being of my invention), first, of the valves of steam engines working in cases as hereinbefore described by me, and referred to in the drawings, which form part of the Specification in figs. 1 and 2, whether such valves and their cases be of a cylindrical or prismatic form; and whether they be designed to be used singly, as the working valves of steam engines now commonly are, or in combination of two, as I have now described as proper for accomplishing the stoppage of the supply of steam to the cylinder at any assignable period of the engine stroke.

Secondly, of the mechanism or combination of mechanical movements, by which the action of the induction steam valve is made variable at any time, whether such mechanism be arranged as I have hereinbefore described it, as calculated to produce the effect, or in any other way which shall embrace the same principle of altering whilst the engine is at work at the times of action of the steam, by an alteration at any moment of the effective leverage of any of the oscillating lever arms betwixt the valves and their first mover. The parts concerned in the changeable action of the valves, as now desbribed, are shown in the drawings at fig. 1.

Thirdly, of an apparatus to be appended to the boiler of steam engines for regulating the injection of water into the boiler, by disabling the force pumps from drawing water, whenever the surface of the water within the boiler attains a certain elevation. This part of my invention is shown in the drawings at fig. 6.

Fourthly, of the mechanism, or combination of mechanical movements hereinbefore described, which allows the driving bearing wheels of locomotive carriages propelled by steam power to accommodate their relative velocities to the exigencies of the case, whenever the path of the carriage is not right lined. The principle of my contrivance is the driving of two bearing wheels independent of each other's action on one axle by a carrier common to both, which can accommodate its action on the two wheels to any difference of rotatory velocity which they may be required occasionally to perform. Two mechanical modes of applying this principle are shown and described in this specification; they are shown in the drawings by figs. 3 and 4. Other modes of applying the principle may readily be devised; and I claim all such modifications as are evidently based on the same principle of action.

Fifthly, of the bearing wheels through which the elastic force of steam is made to propel locomotive carriages constructed with such peculiarities as I have herein described; namely, the connexion of the spokes with the naves, in the manner shown in this specification, and the formation of the rim of the wheel by two rings of wrought angle iron, as herein described. The parts here referred to are shown in the figs. 7, 8, 9, and 10.

Sixthly, of a steam cylinder and piston as applied to produce pressure on the lever of a brake used to retard motion in locomotive carriages propelled by steam, shown in the drawings at fig. 5. To the parts mentioned in this specification as in connexion with my present improvements belonging to steam engines, or to the mechanism instrumental in the propulsion of steam-driven carriages, which are already known and in common use, I do not claim any exclusive right.—[*Inrolled in the Inrolment Office, October,* 1832.]

Specification drawn by the Patentee.

To Joseph Amies, *of Loose, in the county of Kent, paper maker, for his invention of certain improvements in the construction of apparatus to be employed in making paper.*—Sealed September 29th, 1832.]

The following is the description of Mr. Amies' invention, in his Specification of the above Patent:—

" My improvements in the construction of an apparatus to be employed in making paper, consists in a peculiar mode of constructing the bottom of a strainer or sieve to be employed for arresting the knots and lumps in pulp prepared for making paper, and in adapting the said sieves or strainers to that purpose.

" Small particles of dirt, as well as knots, lumps, and other impurities which are found accidentally mixed with paper pulp, being greatly injurious to the paper when finished. Strainers or sieves have been employed to prevent those particles, knots, or lumps, from passing with the fine fibres into the vat or vessel, from which the pulp is immediately taken to mould the sheets of paper. The bottoms of these sieves or strainers have, however, been heretofore so constructed, by combining long bars or rods of metal fixed in the frames, or held together near their extremities, as to allow of very considerable vibration when the sieves or strainers were applied to the intended purpose. This vibration of the bars or rods, caused them to bend and become loose, and consequently to leave openings in the sieves, between which the knots and lumps were allowed to escape with the fine pulp into the making vat, thereby defeating the object intended. My improvements are therefore designed to correct this inconvenience, and are effected in the following manner :—

I form the bottoms of my improved sieves or strainers from plates of brass, or other suitable metal, and produce the apertures for the fine fibres of pulp to pass through by cutting short slits through such plates, taking care that sufficient space or metal is left between the ends of each short slit, and the next following, as will properly brace or strengthen the sieve or strainer. And I prefer that the end of one slit shall be nearly opposite to the middle of the two slits next adjoining it, which is commonly called blocking the joints. This is for the purpose of giving stability to the bottom of the sieve or strainer, and constitutes the main feature of improvement which I claim in the construction of sieves or strainers applicable to the above purpose.

In Plate X, figs. 11, 12, and 13, represent a portion of a sieve bottom, with short slits, cut in the way described. Fig. 11, shows the face or upper surface of the plate ; fig. 12, the back or under surface of the same; fig. 13, is a transverse section of the plate. Having prepared a plate of brass or other suitable metal, of about half an inch in thickness, its surface being smooth, I draw a series of parallel lines across the plate, at about a quarter of an inch apart. In the under surface of the plate, in the direction of these lines, I then form grooves by means of a ploughing tool or other convenient instrument, taking care that the extremity of each alternate groove reaches to about the middle of the next groove on each side. I then, by a circular saw or other suitable means, cut narrow slits at the bottom of each groove, of about the thirtieth of an inch wide, through the plate. By this means a sieve or strainer is formed with narrow slits or elongated apertures, capable of allowing the fine fibres of the pulp to pass through, but stopping or arresting the knots and lumps. By the parts of the plate at the ends of the slits being thus left solid, and those solid portions intervening alternately between the middle parts of the two slits next adjoining, the whole plate will be firmly held together, and subject to much less vibration or liability of bending than long rods or bars, which are secured at their extremities only; or of plates with long slits extending the whole length or width of the sieves.

In applying these sieves or strainers to the purpose of separating the knots, lumps, and other impurities from paper pulp, I mount the sieve in a frame, and subject it to a vibratory or jogging movement, for the purpose of assisting the progress of the fine fibres of the pulp through the slits or apertures. In the accompanying drawings, fig. 14, is a horizontal or plan view of the sieve suitably mounted; and fig. 15, a vertical section of the same; *a, a, a, a,* is a rectangular frame of wood, open at top and bottom; *b, b,* is the perforated metal plate already described, extending horizontally across the wooden frame about two-thirds from its top. This is secured by bolts *c, c, c,* passing perpendicularly through the wood frame, and through the metal plate. Pulp properly prepared for making paper, is to be delivered into the sieve or strainer through a pipe, as at *d.* This sieve is placed in a trough or vessel *e, e, e,* and is supported by jointed arms *f, f,* and the piece *g.* When the pulp is poured into the sieve, as shown in fig. 15, its liquid and fine fibres run through the slits in the sieve bottom into the lower part of the outer vessel *e, e,* from whence it flows over the top of the funnel *h,* and through the pipe *i,* into the vat, or other receptacle from which the paper is to be moulded. The level of the pulp in the vessel *e,* is regulated by turning the screw ring *k,* upon the neck of the funnel *h,* which ring is made conical at the outer part, and by resting in the aperture at bottom of the vessel, determines the height of the discharging level.

In order to facilitate the passage of the fine fibres of the pulp through the strainer, a vibratory motion is given to the sieve with a slight degree of concussion; various contrivances may be adopted to effect this object, but that shown in figs. 14 and 15, I have found to answer the desired purpose. The sieve, as before said, is suspended upon levers or jointed arms *f, f,* which are affixed to the wood frame of the sieve, and turn on pivots in bearings secured to the back of the vessel *e.* Across the middle part of the sieve an arm *l,* extends, which is secured thereto by bolts; and connected with this is another arm *m,* or an elongation of the former, to which is attached the piece *g,* with its tooth or bent extremity *n.* It will now be perceived that the pieces *l, m, g,* and *n,* securely bolted together, and the sieve *a,* form a lever by which the sieve may be raised in the vessel *e.* A horizontal shaft *o, o,* driven by any convenient power, has a tappet or star wheel *p,* fixed upon it, which being made to revolve under the tooth *n*, causes the lever, and with it the sieve, to be raised by every point or tappet as the wheel passes round. The tooth *n*, at the end of the lever in falling from each point or tappet, causes the part *g*, to strike upon the top of the post *q*, which being repeated in quick succession (say two hundred times per minute) as the wheel goes round, produces the vibrations and slight concussions that assist in passing the fibres through the sieve.

Having described the particular features of my improved sieve or strainer, and the mode of applying the same for separating the knots or lumps from the fine fibres of paper pulp, I desire it to be understood, that I do not intend to confine myself to any precise length or width of the slits to be cut in the plate, forming the bottom of the sieve, nor to their distance apart, or to the thickness of the plate from which the strainer is made, all of which will depend upon the quality of the pulp to be operated upon, and the speed with which the strainers are to be moved, and their dimensions, observing that the slits must not be cut completely across the plate, as that would separate it into bars; but the slits must be cut in short lengths, leaving a portion of the solid plate between the ends of each short slit; and I recommend that the slits should be so cut that two short slits in one line may terminate near the middle of the next parallel slit on each side, which will most effectually brace the parts of the sieve together, and prevent the partial vibrations complained of; but the slits may be made in rows in a line with each other, sufficient metal being left between the ends of the slits to brace or strengthen the sieve or strainer, which arrangements may be found to answer the purpose; but I prefer making them as above particularly described.

Lastly, in adopting sieves or strainers made as above described to the separating of knots or lumps from the fine

Heinselin's Motive Power.

Fig. 3.

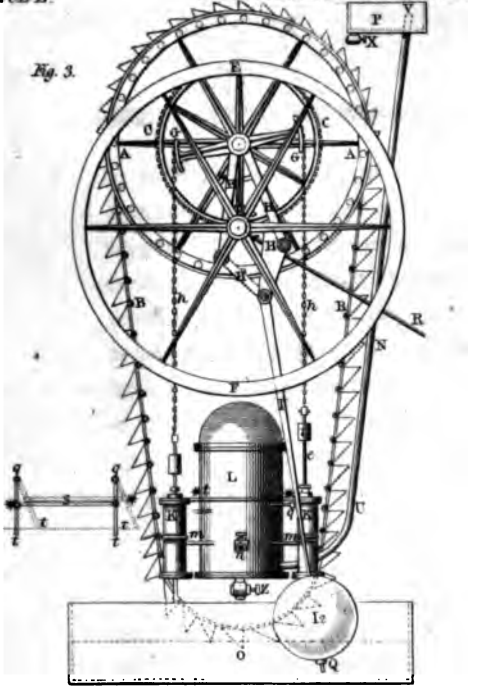
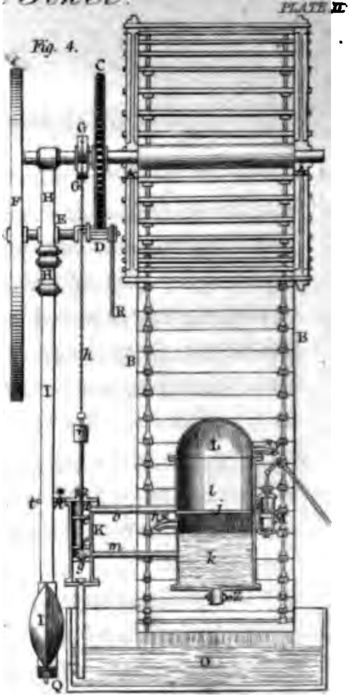
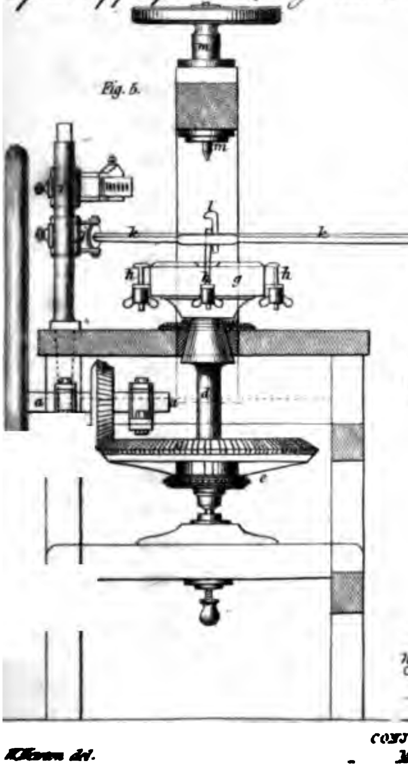


Fig. 4.



...eefts' App.^d for Shaping Metal Plates.

Fig. 5.



Travis's Imp.^d Roving Machine

Fig. 7.

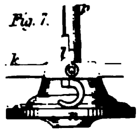


Fig. 6.

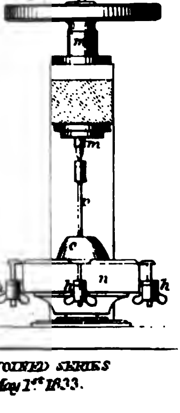


Fig. 1.

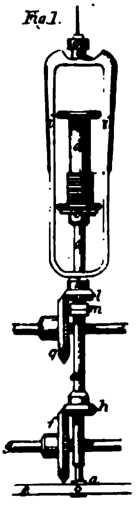
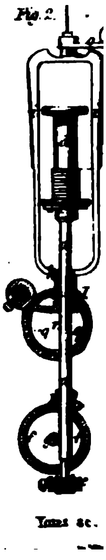


Fig. 2.



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May 1st 1833.

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fibres in paper pulp, I do not intend to limit myself to the lever action and tappet wheel by which the sieve is made to vibrate, but employ, if it should be found more convenient, any other mechanical contrivance capable of producing the required vibratory action, and I adapt these sieves to the straining of paper pulp, either for the use of hand mould vats or of paper making machines.—[*Inrolled in the Rolls Chapel Office, March,* 1833.]

Specification drawn by Messrs. Newton and Berry.

To JOHN TRAVIS, *the Younger, of Shaw Mills, near Manchester, in the county palatine of Lancaster, cotton spinner, for his having invented certain improvements in machinery for roving cotton, and other fibrous substances.*—[Sealed September 29th, 1832.]

THESE improvements in machinery for roving cotton and other fibrous substances, consist in a certain novelty in the formation of the flyers, by which rovings are laid upon the bobbins, and also in the mode of driving them, which improvements are particularly shown in the several figures in Plate XI. fig. 1, is a front view of one spindle with its bobbin and the flyer connected with it, which are shown detached from the machine; fig. 2, is a side view of the same, represented partly in section; *a*, is the spindle, supported in a stop *b*, screwed into the copping rail *c*. The bobbin *d*, is attached to the spindle *a*, bearing upon the boss *e*, which is made fast to the spindle by a screw. The spindle is driven by the wheel *f*, upon the horizontal rotatory shaft *g*, which takes into the pinion *h*, fixed on the spindle; these are made to rise and fall by any of the ordinary modes of effecting the copping.

The arms of the flyer *i, i*, are continued downwards, and united to a boss *k*, at the bottom, seen best in the sectional figure. Upon this boss is fixed the pinion *l*, and the flyer is supported at bottom by the perforated bracket *m*, which is affixed to a stationary horizontal rod *n*, and the flyer is kept perpendicular, and held at top by a similar perforated bracket *o*, affixed to a stationary horizontal rod *p*; the rods *n*, and *p*, being made fast to the frame work of the machine. The flyer is made to revolve by means of a wheel *q*, upon the horizontal rotatory shaft *r*, which wheel takes into the pinion *l*, fixed as aforesaid upon the boss at bottom of the flyer.

It will now be seen that the spindle and flyer move independently of each other, and that if different speeds are given to the shafts *f*, and *g*, they will be made to revolve with dissimilar velocities, and hence that the rovings coming through the central tube at top and down, one of the arms of the flyer will be wound upon the bobbin uniformly as the copping rail moves the spindle up and down. Having described the nature of these improvements, and the manner in which the same are to be carried into effect, the Patentee states in conclusion, that he claims as his invention, the peculiar construction of the flyer for roving cotton, wool, and other fibrous materials in connection with the mode of adapting and actuating the same, as described above.—[*Inrolled in the Rolls Chapel Office, March,* 1833.]

Specification drawn by Messrs. Newton and Berry.

To PIERRE NICOLAS HAINSSELIN, *of Duke-street, St. James's, in the county of Middlesex, architect and engineer, for his invention of a machine or motive power for giving motion to machinery of different descriptions, to be called "Hainsselin's motive power."* —[Sealed July 26, 1832.]

THE above invention is stated in the Specification to consist in a machine for producing motive power, the action of which depends on the descent of an endless series of reservoirs filled with water, which water is raised to a suitable elevation for the purpose, principally by the action of the machine itself, and is another scheme to obtain something like a perpetual motion, which may be added to the long list of futile projects which have gone before it. In Plate XI. fig. 3, is a front view of this apparatus or machine; fig. 4, is a vertical section taken crossways of the machine; A, is a large drum; B, B, an endless chain carrying a series of reservoirs, or buckets, or each bucket may be fastened by a hinge joint to the other, so as to form an endless chain passing over the drum; C, is a cogged wheel, working into the pinion D; and E, is an eccentric, more particularly described hereafter. F, is a fly wheel; G, G, is a balance beam carrying a segment of a circle at each end; H, is what is called an escapement for a pendulum I, leaving a weight I 2, on its end; K, K, are two pumps; L, is the main cylinder of the machine; M, an air pump; N, a pipe through which the water which works the engine is raised; O, is a reservoir to receive the water from the descending buckets; and P, is a reservoir to receive the water from the pipe N. In making these machines the Patentee particularly recommends that the following details should be observed, when it is required to make a machine on this plan equal in power to a steam engine, of which the expansive force is equal to a resistance of 1,000 lbs. in a second. It will be seen that air and water are the two principal agents in my machine. Water, it is known, weighs from 60 to 62 lbs. the cubic foot, and it requires 32 cubic feet of air to balance 1 cubic foot of water; and I have found by various experiments, that my machine employs about three-fourths of its power to produce its own action. From these premises it results, that in order to have a machine on my plan equal to 1,000 lbs. per second, there must be 4,000 lbs. of water in the descending buckets, and 200 cubic feet of air condensed in the cylinder L, by means of the air pump M, which is worked by hand by the lever handle *a*.

Fig. 3, represents 64 buckets fastened together by hinge joints, in such manner as to form an endless chain of buckets, their motion being so contrived that they descend full at one side of the drum, and rise empty at the other side,the drum being about 3 feet 6 inches in diameter—25 of these buckets can retain water at the same time, and in order that the united weights of their contents may be 4000 lbs. it is necessary that each of the 64 buckets shall be of a size (whatever be their form) conveniently to hold 160 lbs. of water.

In order to supply the 25 descending buckets with the required quantity of water, the 2 pumps K, K, are placed a little above the lower reservoir O; the rods of these pumps plumb with the extremities of the balance beam G, G, by which they are worked. The capacity of each of these pumps should be such that each stroke of the piston should raise a column of water to the upper reservoir P, sufficient for the supply of 1 bucket, that is to say, 160 lbs. These pumps, which may be called hydroneumatic, are nearly like ordinary lift pumps, the only difference being that the pump chamber is divided into two parts by the division *f*, the upper part being furnished with the piston of a force pump; the same rod *e*, works both the piston *d*, of the upper part of the pump chamber *c*, and the valve *f*, of the lower part of the chamber *g*. The pump rods *e*, *e*, are fixed to a chain *h*, *h*, which is attached to the segments on the ends of the balance beam G, G, and thereby made to work the pump rods, while the balance weights *i*, *i*, below the extremities of these chains, keep them at a proper degree of tension, and retain the beam on a just balance. The strong cast iron cylinder L, must be capable of resisting the force of the condensed air which it is intended to contain, say at least 240 lbs. The interior of this cylinder is furnished with a division *j*, by which an upper and lower chamber is formed, marked *k*, and *l*; the lower chamber *k*, is intended to receive the water which the pumps K, K, feed it with by means of the pipes *m*, *m*, at every stroke of their pistons; and in this chamber the water frees itself from the air which may have been pumped in with it, and which is suffered from time to time to escape at the cock *n*, when a quantity has collected sufficient in any way to retard the action of the machine. It is from this lower chamber that the water is supplied to the upper reservoir P.

The upper chamber *l*, of the cylinder L, is destined to receive the air which is to be forced into, and thus condensed in it, by means of the small air pump M. It will be seen that two small pipes *o*, *o*, communicate with the upper chamber *l*, of the cylinder L, and the upper chamber *c*, *c*, of the two pumps K, K: these pipes are to let in the condensed air upon the tops of the piston *d*, *d*, to cause the downward movement of their alternate action; *q*, *q*, are two valves, each furnished with a lever *t*, *t*, which levers are connected by a pointed cross bar *s*, as shown in plan view in fig. 2. As the two arms or levers *t*, *t*, of this contrivance project beyond the vertical line of the pendulum I, they are acted upon alternately by the vibration of the pendulum, thus alternately opening and shutting the valves *q*, *q*. The lower reservoir O, may be of any convenient capacity, but the upper reservoir P, should at least be able to contain as much water as twenty-five of the buckets can hold, and the ascending pipe N, through which the water is raised from the lower chambers *k*, of the cylinder L, to the upper reservoir P, should be of such a diameter as to contain exactly the quantity of water required to fill three of the buckets in the space between the point *u*, (which should always be in a line with the divison *j*,) and the point *v*.

The cock X, is to regulate the descent of the water from the reservoir P, into the buckets, which should be just equal to what is pumped up by each pump at each stroke of the piston; *y* is an air cock, communicating with the upper chamber *l*, of the cylinder L, and is to let a portion of the condensed air escape when its too great density causes the engine to work at too rapid a rate.

Z, is a cock for emptying the lower chamber of the cylinder L, when necessary, for repairs or otherwise, and a similar cock or valve should be made to the lower reservoir O, in case, at any time, it should be required to empty it. As it is necessary that each bucket, as it empties itself, should be replaced by a full one, the pinion D, should be so regulated with reference to the toothed wheel *c*, (which is fixed on the same axis as the drum A,) that at every half revolution of the fly wheel F, (which gears in with the pinion D, and is on the same axis with the eccentric E,) one of the buckets shall present itself in turn under the cock X, to be filled.

The pendulum I, is fixed on the same axis as the balance beam G, G, and the object of the eccentric fixed on the axis of the fly-wheel is, to act upon that part of the pendulum which I call the escapement, at *r*, thus propelling the pendulum to one side, while, as soon as the eccentric turns away from *r*, and it thus escapes from the action of the eccentric for a time, its own weight brings it back to be acted upon by the eccentric again, thus keeping up the vibration of the pendulum. The jointed bars at H, H, H, H, which I have called the escapement, form a part of the rod or pendulum I, which is furnished with the weight I 2, which may be raised or lowered on the pendulum, by turning it to the right or left on the thread of the screw Q, to regulate the motion of the pendulum; and this motion may be farther regulated by the segment bar and adjusting screw K, which expands or contracts the jointed bars H, H, H, H, of the escapement at pleasure, and thus allows an increased or diminished action of the eccentric on the part *r*, of the escapement.

R, is a lever to throw the pinion D, in and out of gear with the fly-wheel F, in order to stop the machine or put it in action when required, and it may be well here to describe that this is effected by means of a small arm which, when in gear, protrudes through a hole in the flange; O, O, of the pinion is drawn away from this arm, the fly-wheel and all upon its axis stops, and the pinion turns with the toothed wheel, without effect.

Having described the various parts of this invention, and their several uses, the Patentee proceeds to describe the mode of putting the machine in operation. First, put a sufficient quantity of water in the upper reservoir P, to fill twenty-five of the buckets, and about the same quantity in the lower reservoir O; then open the cock X, of the upper reservoir, and, by means of the lever R, throw the fly-wheel out of gear with the pinion D. By continuing to press lightly on this lever R, it will cause the flange *o*, *o*, to rub against the wheel *c*, which must, by means of the friction thus caused, be allowed to turn slowly, so as to give time to the twenty-five buckets to fill themselves. The moment the whole of the twenty-five buckets are full, the pinion must be quickly thrown into gear with the fly-wheel F, and by means of the lever *a*, of the air pump M, the upper chamber *l*, of the cylinder L, must be charged with air. It will be known when it is full by the sudden resistance the air will make when that is the case. The two foregoing operations will only be necessary when the machine is put in motion for the first time, or when afterwards, for any purpose, it may have been emptied of its air and water.

The machine is now ready to act, and it will only be necessary to give the first impulse to the pendulum, which being done, the weight of the water in the twenty-five full buckets will cause the drum to rotate, as also the toothed wheel *c*: this will act upon the pinion D, which it works into, and will cause the eccentric E, and the fly-wheel F, which are fixed upon the same axis, to revolve, the fly-wheel being so arranged as to make just half a revolution during each vibration of the pendulum.

The eccentric E, which is fixed upon the same axis as the fly-wheel, will always act upon the pendulum, and secure to it its vibrating motion, while the length of the strike will be easily determined by opening or shutting the escapement H, which is performed by turning the screw either to the right or left, as the case may be.

By raising or lowering the weight I 2, so as to make the vibration of the pendulum correspond with the speed of the fly-wheel, this weight I 2, should be of such a weight that when vibrating by its own weight only it will have the power to give full three strokes to the pumps K, K. This pendulum, which is fixed on the same axis as the balance beam G, G, will give an alternate movement up and down to each arm and segment of the beam, and these segments being connected with the rods *e, e*, of the pumps K, K, by means of the chains *h, h*, their motion will work the pumps, and raise the water from the lower reservoir O, to the upper P, through the lower chamber *k*, of the cylinder L, and the ascending pipe N, whence it will again flow through the cock X, to fill in succession the sixty-four buckets of the machine.

The pendulum I, in its passage from side to side, strikes alternately the arms of the lever *t, t*, which opens and shuts the valves *q, q*, in order alternately to let escape and confine the air in the upper chamber *l*, of the cylinder L. The portion of the air which the alternate motion of the valves *q, q*, allows to pass into the upper chamber of the pumps K, K, expands, and acting with all its force on the upper side of the piston *d*, forces it down to the small openings *p, p*, cut in the pump chambers for that purpose, and escaping there, relieves the piston of the pressure; while the balance weights *i, i*, keep the chain *h, h*, stretched out, and the balance beam G, G, in equilibrio. In order to preserve the density of the air in the upper chamber *l*, of the cylinder L, the operator must occasionally pump the chamber full of air by means of the pump M; if this be done every five or six minutes, it will prevent the necessity of spending two hours when the machine first starts to charge the chamber. The Patentee states, in conclusion, that it is evident that the power of the machine hereinbefore described, may be applied to any of the ordinary purposes for which the power of steam engines is now used!! And claims as his invention, the machine hereinbefore described.—[*Inrolled in the Inrolment Office, January,* 1833.]

To William Joyce, *of Bow, in the county of Middlesex, harness maker, for certain improvements in the making or constructing of collars for horses and other animals.*—[Sealed 22nd of August, 1832.]

These improvements in the construction of collars for horses and other animals, consist in substituting stout flexible yielding leather braces, or of pliable braces, formed of any other proper flexible or yielding materials, which braces are intended to be used in place of the ordinary iron frames or stiff harness. These improved collars are capable of adapting or adjusting themselves more accurately to the forms or shapes of the shoulders, necks, and other parts of the horses or other animals, and thereby avoiding the mischievous effects caused by the galling or rubbing, proceeding from the unequal bearing of the ordinary collars.

There are also improvements in the modes of affixing the said braces upon the upper and lower parts of the pads, or body parts of the collars, as well also in the methods of affixing the draft links, and the pole link to the said braces, and the terretts to the bottom parts of the collar.

In Plate XII. fig. 3, represents two pieces of leather, which when lined with serge, and quilted and stuffed with flocks or hair, and sewed together, form the body part of the collar, which is soft and elastic. The body part is again to be covered with two other pieces of leather of similar forms, which strengthen it, and enable it better to support the main brace; fig. 4, is a long slip of leather, which is coiled or rolled up (as shown in the section), and secured by pasting or otherwise; this forms a fore-wall, or rim of the collar, and after being enclosed in another slip of leather, is affixed by stitching upon the body part of the collar, as shown at *a*, *a*, in fig. 5; the leather heading, which holds the martingale ring *o*, is then affixed to it by stitching, and the body part is then ready to receive the main brace, shown detached at fig. 6, which is made of two thicknesses of stout leather stitched together, and partly divided on each side, so as to form two distinct parts *c*, and *d*; it is then made fast by strong stitching to the top and bottom parts of the body of the collar, and supersede the common hames or harness. There are draught links *e*, affixed to the main brace in the following manner:

Fig. 7, represents one of the draught links, which is united by the screws, to the inner plate *f*, after the latter has been placed between the two leathers, and firmly affixed thereto by rivets. In like manner the pole link is affixed to the lower part of the main brace by screws which pass through holes *g*, *g*, made through the main brace, as shown in fig. 6.

The terretts for the reins to pass through, are to be screwed into sockets affixed in the body part of the collar, as shown in their place in fig. 8, and which said sockets pass through holes or slits made through the upper parts *c*, *c*, of the main brace.

There is a serge lining stuffed with flocks or hair as before mentioned, which is to be covered with two other pieces or body linings of soft leather, similar in shape to those shown at fig. 3.

Fig. 10, shows two strengthening pieces, which are to be laid at *h*, *h*, in fig. 3. A side border, formed of a narrow slip of leather, is also to be sewed to the extreme edges of the after-walls or main brace cover, and which is then ready to be basted in its place upon the body of the collar over the main brace in the following manner:—The main brace cover is laid upon the outer surface of the body of the collar thus far made, and is basted round the fore-wall. The leather border or calash is then to be stitched through and through, which makes this part of the work of the collar complete, as shown in the figures 8, and 9.

The second stuffing of flocks or curled hair, is then to be performed over the serge, and underneath the soft leather linings before mentioned are to be brought over and basted on to the body part of the collar, thus retaining the second stuffing between them; the body part is then to be quilted.

Two pieces of leather are then to be stitched on each side of the body of the collar underneath the draught links, as shown at *i*, *i*, in figs. 8, and 9. The stitching is then to be completed all round the body part of the collar, and thus uniting the body part of the collar with the after-wall or cover of the main braces, excepting at the parts on each side, which must be left open to admit the draft links to be secured in their places by means of the screws as above mentioned; the draft tugs or loops being previously placed upon the links. The pole link may then be screwed into its place as shown in the figures, and the terretts also.

In order to make these improved collars capable of fitting different sized horses or other animals, the two upper ends of the collar are not connected or made entire as in fig. 8, but are left open as shown in fig. 9. A shifting top *k*, formed of leather, and stuffed and quilted underneath in the middle; each end of it is furnished with one, two, or more leather straps, which are passed through the upper lining of the shifting top; these straps can be secured at any required position, by means of buckles firmly attached to the main brace of the collar. In order to afford free space for the gullet of some horses when it protrudes more than usual, a curved piece of iron is

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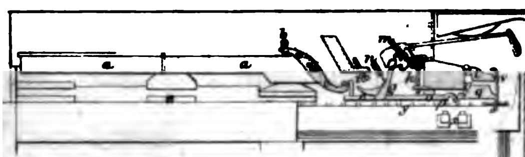
ASTOR, LENOX AND
TILDEN FOUNDATIONS.

Fisher's Impd
Piano Fortes.

Fig. 11



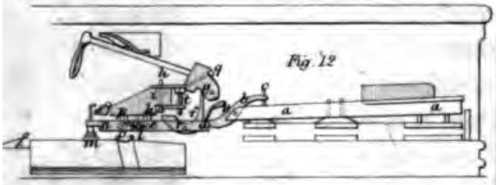


Fig. 12

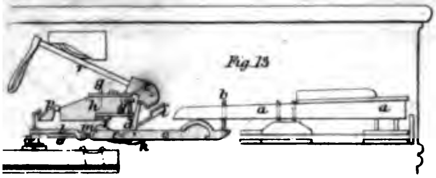


Fig. 13

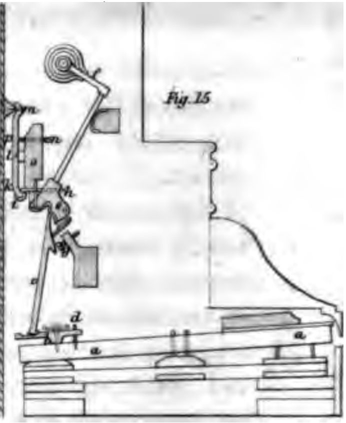


Fig. 15

Fig. 14

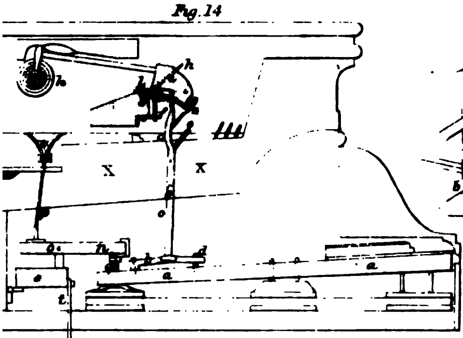
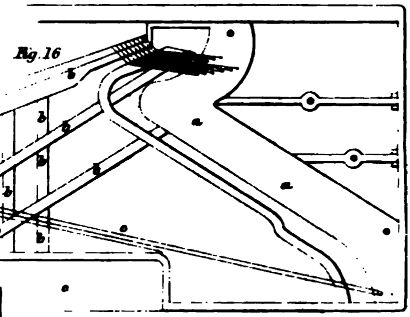


Fig. 16



Joyce's Impd
Horse Collars.

Fig. 3

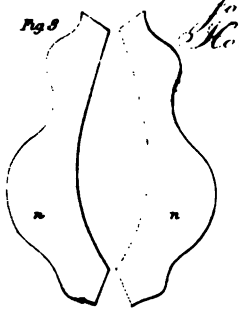
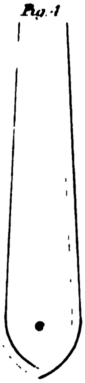


Fig. 1



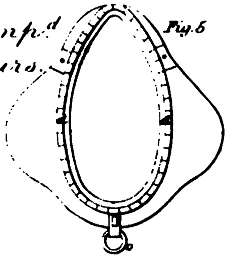


Fig. 5

Fig. 6

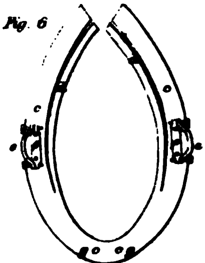


Fig. 7

Fig. 8

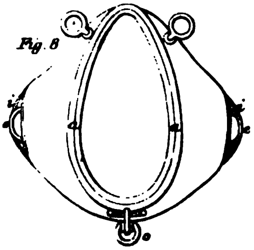


Fig. 9

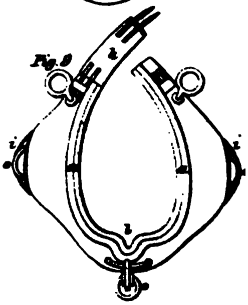
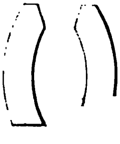


Fig. 10



introduced in the lower part or throat of the collar, and within the fore-wall, which is then bent along it, and covered over with a strip of leather. The Patentee states in conclusion, " having shown and described various constructions of my improved collars for horses and other animals, I hereby declare that I do not mean or intend thereby to limit or confine myself to those constructions only, but to vary them according to circumstances, still however retaining the main braces, in place of using the stiff and unyielding hames in general use; the main braces forming the chief novelty of my invention, in whatever form it may be necessary to employ them. Neither do I mean or intend hereby to limit myself to the employment of such materials only as are herein mentioned, but on the contrary I hereby claim as my invention, the use of any others which may be fit and proper for the purpose. Neither do I mean or intend hereby to claim as my invention any of the various parts composing these said collars which may already be known, or in use, but on the improved methods of combining or uniting them with the main brace, as above described."—[*Inrolled in the Inrolment Office, July,* 1833.]

To PIERRE FREDERIC FISCHER, *of Chester-place, Regent's Park, in the county of Middlesex, gentleman, for an invention communicated to him by a certain foreigner residing abroad, of certaim improvements in piano-fortes.*—[Sealed 8th September, 1832.]

THE improvements upon piano-fortes, as described in the Specification of the above Patent, consist principally in causing the hammers to strike from above on the strings against the sounding board and bridge, the strings receiving the blow from the top, so that they cannot be lifted up by the hammer, and consequently produce a stronger and clearer sound. The Patentee states, that the manner in which the strings are placed, tend to prevent their breaking; and, from the nature of the construction, the improved pianos will keep lonr gein tune. Plate XII. fig. 11, is a section showing the arrangement of the keys and mechanism for a square piano; *a*, is the key; *b*, is a screw, with two different threads, which regulate the lever *c*; *d*, is its fulcrum, which passes through the key. This lever touches under the hook fixed on the lever *e*, which bears the hopper *g*, and catches under the nut of the hammer *h*, in order to raise it. The screw *i*, serves to push it out of its notch, and effects its escape; *k*, is a spring coiled on a wire, and surmounted by a leather button *l*, on which the screw *m*, rests; this screw passes through the nut of the hammer *h*, and serves to regulate the strength of the spring, in order to raise up the hammer by the spring; *n*, is the check, which serves to catch the hammer. The lever *e*, has its centre at *o*, and presses, when in action, on a screw *p*, which ish eldin another lever *q*, the centre of which is at *r*; and at its extremity is the damper *s*. The hinge piece *t*, operates the forte in raising the damper by the hook *v*. Two moveable pieces *x*, covered with leather, are placed above the sounding board, and near to the strings *y*, and serve by means of pedals to damp one or two strings at pleasure, and dispense with the tuner damping each cord separately; *z*, is the bottom on which the key rests. Fig. 12, shows another arrangement for a square piano; *a*, is the key; *b*, the lever, regulated by the screw *c*; this lever moves in a brass box *d*, fixed on the lever *e*, which bears the hopper *f*, the centre of which is at *r*. The hopper touch is under the notch *g*, and lets the hammer escape by means of the screw *h*, which passes through the hammer rail *i*.

The lever *e*, is fixed by a screw *k*, to the hammer rail; and has, for its centre the point *l*, and raises up the damper *m*, by pressing on the other lever *n*, the centre of which is at *o*. This piece is also fixed on the hammer rail, by the screw *p*; *t*, is a coiled spring, which serves to raise the hammer, by pressing on the screw *q*, as is explained in the first figure. The forte is produced by the hinge piece *s*, as above explained; *v*, is a check piece, screwed also in the piece *e*, and serves to catch the hammer after having struck.

Fig. 13, is another arrangement for the same piano; *a*, is the key; *b*, the double screw, which passes through the key, and the piece *c*, which is a continuation of the key, and bears the hopper *d*, the centre of which, is at *e*, and is placed in opposite inclination to the first figure, producing its escape by pressing on the button *f*, mounted on the screw *g*, which crosses the hammer rail *h*. The spring *k*, serves to push back the hopper; the check *i*, is placed in the hopper, and receives the hammer.

At the extremity of the lever *c*, is a piece *l*, with its centre at *m*; the extremity of this piece *l*, leans on the damper *n*, which is raised up by the brass wire *o*, fixed in the lever *c*; *p*, is a hinged piece which operates the forte, as before explained; *q*, a coiled spring, which serves to raise the hammer *r*, as already described; *t*, is the hammer nut.

Fig. 14, shows an arrangement for a grand piano-forte. The same mechanism is used for the square piano, except the alterations required by the difference of the form. In this kind of piano the sounding board is convex at the base, which admits curtailing its length by eighteen inches, without reducing the quality and power of the sound; *a*, is the key; *b*, a piece carrying the hopper *c*; *d*, a double screw serving to regulate its length; *e*, another screw passing into the block and producing its escape; *z*, is the check screw into the hopper, serving to catch the hammer when it has struck; *f*, a coiled spring mounted on a brass wire, and surmounted by a leather button *g*, on which rests the screw *h*, which crosses the hammer nut *i*, and serving to regulate the strength of the spring, and for raising the hammer *k*, by the same spring; *l*, is a brass plate, which serves to fix the centre of the hammer nut at *m*; *n*, is a lever bearing the damper *p*, lifted up by the button *q*; the lever *p*, produces its operation by moving on its fulcrum at *o*; *s*, is a hinged piece, which being drawn down by the pedal *t*, produces the forte.

Fig. 15, shows an arrangement for a cabinet piano; *a*, is the key; *b*, the lever which bears the hopper *c*, and is regulated in height by the double screw *d*. The hopper *c*, catches under the hammer notch *e*, and by raising the hammer *f*, touches the button *g*, which effects the escape; *h*, is the check passing through the hammer nut *e*, and bearing on a small wheel *i*, fixed to the lever *k*, which by moving on its centre *l*, lifts the damper *m*, placed at the other end; *n*, is a screw passing through the hammer rail *o*, and carrying a coiled spring *p*, which presses against the lever to cause the damping.

Fig. 16, is a plan view of part of a square piano. This figure represents the sounding boards with its carriages on the top, and the rasping block *a*, of cast iron, covered with brass, the inside of which is filled up with wood, sheathed with brass, passing over the sounding boards, curtails the length of the strings, and thus facilitates the turning; *b*, is the great bars of the sounding board, which are usually placed below, but are here placed above, and screwed from below. By this construction no part of the belly can get unglued even when the instrument is exposed to damp; *c*, is the bottom, on which the frame of the key is placed.—[*Inrolled in the Inrolment Office, March*, 1833.]

NEW PATENT LAWS.

Suggested Amendments on Mr. Godson's Bill.

THE importance of obtaining an effective Code of Laws relating to Patent property, has, as we anticipated, attracted the attention of the manufacturing interests in Birmingham, Manchester, Leeds, Glasgow, Sheffield, and Nottingham, in all which places Meetings have been convened for the purpose of considering the several clauses of Mr. Godson's Bill now pending in Parliament, "to explain and amend the Laws respecting Letters Patent for Inventions;" and in order that the views of those interested in this subject may be known, we give a copy of the original Bill, with the proposed Amendments, as adopted after considerable discussion and deliberation in Committee by a numerous and highly respectable meeting of Patentees, Merchants, and Manufacturers resident in Leeds.

CROSSLAND'S HOTEL, LEEDS, April 13, 1833,

MR. FAIRBAIRN IN THE CHAIR:

IT WAS RESOLVED THAT,

1. It is the opinion of this Meeting that any new Invention or Discovery, the developement of which may become useful to society, is undeniably the property of him from whom it originates, and that it is highly advantageous to the Arts and Manufactures that the property of such Inventions or Discoveries should be secured to their Authors under Letters Patent; that the existing Laws do not afford sufficient protection to such property; and that the expensive fees and stamps charged on grants of Letters Patent, tend considerably to depress the ingenuity and industry of the country.

2. That this Meeting perceives, with much satisfaction, a Bill "to explain and amend the Laws respecting Letters Patent for Inventions," has been introduced into Parliament by Richard Godson, Esq. M.P. for Kidderminster; but, whilst they acknowledge their obligations to that Gentleman, they feel themselves called upon to suggest certain Alterations and Additions to the Bill.

3. That Mr. Newton, of London, be requested, on behalf of this Meeting, to submit to Mr. Godson the Additions and Amendments to his Bill approved by this Meeting, and to urge the propriety of their adoption, viz.:—

5. [And be it further Enacted, That the Letters Patent shall not become void, although the Manufacture may have been used in any particular part of the United Kingdom of Great Britain and Ireland for which the Letters Patent may have been granted, either privately or in an imperfect manner, or has not been practically used in a public manner, within the last *Ten* Years, prior to the date of the said Letters Patent.]

(*See Clause* XVII.)

XIV. AND whereas the grant of Letters Patent, giving an exclusive monopoly to the Patentee, his Heirs, or Assigns, to make, exercise, and vend the said Invention for a limited Term of Years, it is expedient that, after the expiration of the said Term, the Public should have the benefit of the Invention or Discovery, with full liberty to make, exercise, and vend the same; BE it therefore Enacted, That the grant of such Letters Patent shall contain a proviso that the Patentee shall prepare, or cause to be prepared, an Instrument in Writing (accompanied with Drawings, if necessary,) containing a full and particular Description of the said Invention or Discovery, and of all things claimed and intended to be secured by the said Letters Patent, and in what manner the same is to be performed, to the best of his knowledge and belief: AND that he, the Patentee, or his Representative, by Power of Attorney duly authorised, or his Executors or Administrators, in case of Death, shall sign, seal, and deliver the said Instrument as the Specification of the said Invention or Discovery, before Two credible attesting Witnesses, (and not before a Master in Chancery, as heretofore,) and cause the same to be deposited for Enrolment with the proper Officer appointed to receive the same, by the Attorney-General or Solicitor-General, within the Term of Calendar Months, as directed in the said proviso;

in Great Britain and Ireland who may have received from any Person being Abroad, or from any Person being resident within the Kingdom, Information of any new Manufacture whatever, so that he may have the said Letters Patent in his own name.]

3. [And be it further Enacted, That any person in Great Britain and Ireland may communicate or sell any Invention that he may possess, unto and to any Person whatever, who may and shall be at liberty to obtain Letters Patent in his own name, provided the said Letters Patent shall contain a recital that the said Invention hath been communicated or sold to the Person in whose name the said Letters Patent are granted.]

4. [AND whereas Doubts have arisen respecting the new Manufactures or Subjects for which Patents ought lawfully to be granted: And whereas Doubts have also arisen as to the extent of the Use of a Manufacture, which may prevent its being the lawful subject of Letters Patent: And whereas it is impossible to enumerate every kind of Manufacture which ought to be protected by Letters Patent: BE it further Enacted, That all new Substances or Things made; that all new Machines: that all new combinations or arrangements of Machinery or Things, either already known or newly discovered; that all Principles newly discovered, and all new Applications, which, when reduced into practice, produce some Article fit for sale; that all Chemical Discoveries, Methods, or Process, which result in, or produce an Article of Commerce, shall be the subjects for which Letters Patent shall be granted, whether they be discovered within the United Kingdom of Great Britain and Ireland, or be obtained by communication or sale, as aforesaid.]

said Petitioner, (or is solicited by him with the consent of the original Inventor resident in these kingdoms,) or was invented abroad, and communicated to him; an affidavit of the facts being made by the Petitioner, and presented with his Petition.

IV. AND be it further Enacted, That any British Subject or Foreigner residing in these Realms may communicate, sell, or assign his or her Invention or Discovery unto any other Person or Persons whatever, who shall, on receiving such communication, be at liberty lawfully to obtain Letters Patent in these Kingdoms in his or their own Name, for the said Invention or Discovery so communicated to him; provided that the Party communicating, selling, or assigning the same, do make oath that he or she is really and truly the original Inventor or Discoverer thereof, and that the same has not been made or practised, or assigned to any other Person or Persons within these Realms, to the best of his or her knowledge and belief; and provided the said Letters Patent shall contain a recital of the Affidavit that the said Invention or Discovery has been so sold or communicated by the said Deponent to the Party in whose Name the said Letters Patent are granted.

II. AND whereas it shall be lawful to grant Letters Patent for any newly contrived Machine, Engine, or Apparatus; and for any Improvements in existing Machines, Engines, or Apparatus; and for any new or improved Combination, Arrangement, or Adaptation of Material things, whether Mechanical or Chemical, which shall produce a useful result; and for any new or improved Manufacture, Process, or Mode of Operation, designed for the purpose of accomplishing a beneficial object: provided the same shall not be publicly known or in use in these Kingdoms.

6. AND whereas there is often great difficulty in giving a full Description of an Invention, by which it can be readily performed or made either by a written Account or Drawings thereof; BE it further Enacted, That it shall be lawful for the Patentee, in addition to his written Description to deposit* a Model or Pattern of his Invention† in some Public Building, to be named by the Attorney-General in his Report or Bill, and that the said Model or Pattern may be produced or given in evidence by any person whatever in any Court of Law or Equity.

7. AND whereas it often happens that Omissions are accidentally or unintentionally made in the Specification of an Invention: AND whereas it often happens that the Patentee discovers some improvement upon the subject for which the Letters Patent have been granted, and he is deterred by the great expense thereof from taking
ment, which is ofte
shall be lawful for t
fication or Specifica
those Improvements.

tor-General, before the Certificate is given, and that he shall be liable in law for the customary costs and charges of Inrolling the same in Chancery.

XVI.

* if he shall see fit

† within a stated time]

XVIII.

8. [*And be it further Enacted, That such second or third Specification shall bear a Stamp Duty of* *Pounds*: Provided always, That such secondary Specification be made before any Suit at Law or Equity be depending, either to cancel or uphold the said Letters Patent.]

9. [And be it further Enacted, That if the Patent and Specification be bad in law as to part thereof, they shall not be bad in law as to the remainder thereof respectively, and that the said Inventor shall be bound, and he is hereby required, upon the decision of any Court of Law or Equity, that the same is bad in law in part, to enrol another Specification thereof, *which shall be written on a piece of Parchment, bearing a Stamp of* *Pounds*.]

10. [And whereas many Letters Patent have been declared to be void, and great expense and loss of labour have arisen from the strict rules by which the Name or Title of the Invention in the Letters Patent, and the Description of the Invention in the instrument called the Specification, have been construed: BE it Enacted, That the Court or Judge before whom any proceedings at law or Equity may be taken upon any Letters Patent, shall have power, and are hereby authorised to amend the Title or Specification in all matters of form or description which could not have misled any persons acquainted with the subject thereof.]

[illegible] claimed under a Caveat, the Members of the Consul ; Board and the Attorney-General or Solicitor-General shall ify their approval of the same, and order that the Specificati enrolled within one month from the time of depositing the Petition; and that the Invention described in the same do from the time of granting the Certificate, form part of the original Letters Patent, and be subject to the like conditions, the costs of which examination and enrolment being paid as before directed.

XVII. AND whereas it may happen that, through ignorance and without any intention of fraud or deception, a Patentee may include in his Specification as new, certain parts of a Machine, Structure, Improvement, Process, or Product, which may have been used, or partially known, in these Kingdoms before the Grant of the said Letters Patent; let it be enacted that such part or parts of the Specification being bad, shall not vitiate the whole, but that the Patentee shall lose all exclusive right to such known parts, yet retain those parts which are new. AND whereas it may happen that the said Invention or Discovery, or certain parts of the same, may have been, either privately, or in an imperfect manner, employed in some parts of these Kingdoms; BE it Enacted, that if the same shall not have been in public use, within seven years from the date of the said Letters Patent, that such knowledge or use of the Invention shall not invalidate the said Patent Right, in the whole or in part.

6. AND whereas there is often great difficulty in giving a full Description of an Invention, by which it can be readily performed or made either by a written Account or Drawings thereof; BE it further Enacted, That it shall be lawful for the Patentee, in addition to his written Description to deposit* a Model or Pattern of his Invention† in some Public Building, to be named by the Attorney-General in his Report or Bill, and that the said Model or Pattern may be produced or given in evidence by any person whatever in any Court of Law or Equity.

7. AND whereas it often happens that Omissions are accidentally or unintentionally made in the Specification of an Invention: AND whereas it often happens that the Patentee discovers some improvement upon the subject for which the Letters Patent have been granted, and he is deterred by the great expense thereof from taking out new Letters Patent for the said Improvement, which is often lost to the Public: BE it Enacted, that it shall be lawful for the said Patentee to make and enrol a Specification or Specifications supplying those Omissions or including those Improvements.*

tor-General, before the Certificate is given, and that he shall be liable in law for the customary costs and charges of Inrolling the same in Chancery.

XVI.

* if he shall see fit

† within a stated time]

XVIII.

* which, by Petition to the King, shall be referred to the Attorney-General or Solicitor-General, and his Board of Advisers, to be examined in the same way, and subjected to the same conditions as the first Petition; and if in the Judgment of the Attorney-General or Solicitor-General and their Board of Advisers, the said Specification shall appear to accord with the general features

8. [*And be it further Enacted, That such second or third Specification shall bear a Stamp Duty of Pounds:* Provided always, That such secondary Specification be made before any Suit at Law or Equity be depending, either to cancel or uphold the said Letters Patent.]

9. [And be it further Enacted, That if the Patent and Specification be bad in law as to part thereof, they shall not be bad in law as to the remainder thereof respectively, and that the said Inventor shall be bound, and he is hereby required, upon the decision of any Court of Law or Equity, that the same is bad in law in part, to enrol another Specification thereof, *which shall be written on a piece of Parchment, bearing a Stamp of Pounds.*]

10. [And whereas many Letters Patent have been declared to be void, and great expense and loss of labour have arisen from the strict rules by which the Name or Title of the Invention in the Letters Patent, and the Description of the Invention in the instrument called the Specification, have been construed: BE it Enacted, That the Court or Judge before whom any proceedings at law or Equity may be taken upon any Letters Patent, shall have power, and are hereby authorised to amend the Title or Specification in all matters of form or description which could not have misled any persons acquainted with the subject thereof.]

and to form a necessary part of the subject described in the former Specifications, and provided that no similar I tion be claimed under a Caveat, the Members of the Consul Board and the Attorney-General or Solicitor-General shall ify their approval of the same, and order that the Specificati enrolled within one month from the time of depositing the Petition; and that the Invention described in the same do from the time of granting the Certificate, form part of the original Letters Patent, and be subject to the like conditions, the costs of which examination and enrolment being paid as before directed.

XVII. AND whereas it may happen that, through ignorance and without any intention of fraud or deception, a Patentee may include in his Specification as new, certain parts of a Machine, Structure, Improvement, Process, or Product, which may have been used, or partially known, in these Kingdoms before the Grant of the said Letters Patent; let it be enacted that such part or parts of the Specification being bad, shall not vitiate the whole, but that the Patentee shall lose all exclusive right to such known parts, yet retain those parts which are new. AND whereas it may happen that the said Invention or Discovery, or certain parts of the same, may have been, either privately, or in an imperfect manner, employed in some parts of these Kingdoms; BE it Enacted, that if the same shall not have been in public use, within seven years from the date of the said Letters Patent, that such knowledge or use of the Invention shall not invalidate the said Patent Right, in the whole or in part.

MR. GODSON'S BILL.	PROPOSED AMENDMENTS.
11. [And whereas the present mode of obtaining Letters Patent is most irksome and injurious to Inventors: AND whereas the Sign Manual of his Majesty may be, without detriment to the Public Service, dispensed with, as to the Warrant and Bill of Letters Patent in England: BE it further Enacted, That Letters Patent for Inventions may be granted for England, under the Great Seal, in the manner following, (that is to say) that the said Inventor or Inventors may be permitted to present a Petition, addressed to his Most Gracious Majesty, setting forth and declaring that he is the first or true Inventor of some new Invention, naming it, and also declaring whether it be his intention or not to take out Letters Patent either in Scotland or Ireland; but that he shall not be required or called upon to make an Oath in support of the said Petition.]	VIII. AND be it further Enacted, That in order to prevent any irregularity as to priority of Patent Rights, every Patent shall be secured (if ultimately granted) from the day and hour of presenting the Petition: provided the Petitioner causes all subsequent Fees to be paid, and application to be made at the proper Office for appending the Great Seal to his Patent within *Three Months* from the date of his Petition: in default of which all Fees paid, and Privileges resulting therefrom, to be forfeited.
12. And be it further Enacted, That the said* [Inventor shall] make a short description of his Invention, to be called a Preparatory Specification, which shall contain an outline or sketch of his said Invention; and that he shall deliver the said Preparatory Specification, sealed up with the said Petition, at the Office of the Secretary of State for the Home Department, and thereupon paying the Fees hereinafter required.	V. * Petitioner for Letters Patent.
13. And be it further Enacted, That the said Petition and the said Preparatory Specification, so sealed up as aforesaid, shall be referred by the said Secretary of State to his Majesty's Attorney or Solicitor-General, who shall report thereupon and make out a Bill, as heretofore, for the purpose of the said Bill being carried to the	VI.

out and receiving the Great Seal of England; [Provided always, that it shall not be necessary to take the Bill to the Offices of the Signet, Privy Seal, or Hanaper.]

14. [And be it further Enacted, That the Lord High Chancellor, or the Keeper of the Great Seal, may and is hereby required to affix the Great Seal to Letters Patent for Inventions, upon the authority of the said Bill and Report of his Majesty's Attorney or Solicitor-General; and that the Letters Patent shall bear date from the day of presenting the Petition at the Office of the Secretary of State for the Home Department, or the day of the date of the Report of the Attorney or Solicitor-General, if he may so report.]

15. [AND whereas great Abuses have sprung up from the manner in which persons enter Caveats in the Court of Chancery and at the Offices of the Attorney or Solicitor-General, and many Inventors have been injured by the Secret of their Inventions transpiring before the Letters Patent were sealed; BE it Enacted, That Caveats shall not be entered at those Offices, except at the Office of the Attorney-General, during the *Fifteen* Days from the day of the Title to a Patent appearing in the Gazette; and each person or party entering a Caveat shall, at the time of entering the same, lodge in the Office of the Attorney-General an outline or description of his own Invention, which he imagines or thinks is about to be made the subject of Letters Patent to be granted to another person, to be called the Preparatory Specification.]

16. AND whereas it is necessary for the detection of Frauds and the prevention of improper Letters Patent, and also for the determination of the priority to be given to Letters Patent, that his

IX. AND whereas it is highly important for the Protection of Experimentalists, and others who are intending to solicit Letters Patent for Inventions, that Caveats should be received by the Attorney and Solicitor-General, in order to prevent surreptitious Patents passing the Report; BE it Enacted, That Caveats may be entered as heretofore, to be in force for one Year, against any Patent passing the Report for a specific object named; and that on entering such Caveat, the Party claiming an Invention shall be bound to deliver a Sealed Packet, containing a preparatory Specification or Explanation of the Object to which his Invention or Discovery applies, and a general Description of the principles or leading features by which he proposes to carry the same into effect, and on which his Invention rests.

VII.

Majesty's Attorney or Solicitor-General should have the assistance of men practically versed in arts and sciences; BE it further Enacted, That *[if any Caveat be entered or objection raised to the grant of any Letters Patent within *Fifteen* Days from the publication in the Gazette as aforesaid, then the Attorney or Solicitor-General shall require the Parties objecting to lay a statement, in writing, of their objections before him the Attorney or Solicitor-General, who may thereupon call to his assistance any Two Men practically skilled in the Arts and Sciences, to assist him in coming to a determination whether such Letters Patent ought to be granted, or to whom they should be granted.]

17. [And be it further Enacted, That the said Attorney-General or Solicitor-General may direct any and what costs they think fit and proper to be paid to the said Examiners, or by or to whom each Party respectively; and that the said Attorney-General or Solicitor-General may direct, in his Report, whether the Letters Patent to be granted shall bear date from the day of the Petition, as aforesaid, or from the date of his Report.]

* the Attorney-General and Solicitor-General be empowered to appoint three persons learned in the Arts and Sciences, and Manufactures, to constitute a Consultive Board, to whom all Petitions for Letters Patent, and all Specifications, shall be referred, for the purpose of advising the consciences of the Attorney or Solicitor-General as to his Report upon the Petition to his Majesty.

AND be it further Enacted, That on the presentation of a Petition to the Attorney-General or Solicitor-General, for the grant of Letters Patent for any Invention or Discovery, the Deputy or Clerk of the Office shall give notice in writing of the same to all Parties claiming under Caveats, the right to an Invention for a similar object; which Parties shall be at liberty to question (within fifteen Days) the right of such Petitioner, and to demand a hearing before the Attorney-General or the Solicitor-General, and their Board of Scientific Advisers, upon the merits of the respective claims, as set out in the preparatory Specifications of the Petitioner and of the Opponents. And that at such hearing before the Attorney-General or Solicitor-General and his Board of Advisers, the said preparatory Specifications shall be opened, and if it should appear necessary, further information shall be called for from all Parties claiming to be heard; and if the Invention of the Petitioner shall be found not to interfere with those described under the opposing Caveat or

18. AND whereas it is expedient that the Costs and Expenses of obtaining Letters Patent for Inventions in England should be lessened; BE it Enacted, That the Fees payable at the Offices of the Secretary of State, the Attorney-General, or Solicitor-General, the Signet Office, the Privy Seal Office, and the Great Seal Office. *[shall, and the same is hereby reduced to   of the amount heretofore by custom paid when the Letters Patent are granted for the term of *Fourteen* Years, and that the said Expenses shall be reduced, and the same are hereby reduced to   of the amount heretofore by custom paid when the Letters Patent are granted for the term of *Seven* Years.]

Caveats, and no other legal objection exists, the Attorney-General or Solicitor-General shall then sign an approbatory Report to his Majesty, recommending the grant of Letters Patent to the Petitioner; the costs of every such hearing (not exceeding £5. 5*s.*) to be paid by the opposing party.

XI. AND be it further Enacted, That if the Invention of the Petitioner, and that claimed under an opposing Caveat, shall be the same, or interfering with each other, in the opinion of the Attorney-General or the Solicitor-General, and their Board of Advisers, that then the Attorney-General or Solicitor-General shall call further Evidence, in order to determine to which of the Parties a priority of right shall be adjudged as to the whole or to certain parts of the Invention; and he shall be empowered to determine to whom the right of Letters Patent shall be granted for any part or the whole of the said Invention; and the Attorney or Solicitor-General shall order the costs of such hearing to be paid by either or both parties, as he shall see fit.

XII.

* shall be and the same is hereby reduced to the sum of £.60 when the Letters Patent are granted for the term of *Fourteen* Years, and the sum of Thirty Pounds when the Letters Patent are granted for the term of *Seven* Years; and that all the Stamp Duties upon the same be included in those charges.

19. [And be it further Enacted, That the Fees payable at the Offices of the Secretary of State, Signet, and Privy Seal, shall be paid to some person authorised to receive the same at the Office of the Secretary of State, at the time the Inventor leaves his Petition there, and that the Fees payable at the Hanaper shall be paid to a person authorised to receive the same at the Office of the Great Seal.]

20. [AND whereas the Costs and Expenses of obtaining Letters Patent are unnecessarily increased when taken out for Scotland and Ireland by the Patentee of an Invention for England; BE it further Enacted, That an Inventor who has obtained Letters Patent for England may have Certificates of the grant of the same, which shall be lodged with the Attorney-General or Solicitor-General for Ireland, or the Lord Advocate for Scotland, [and be advertised in the Edinburgh or Dublin Gazette;] and if no Caveats are entered or opposition made, then the said Attorney-General or Solicitor-General for Ireland, or the Lord Advocate for Scotland, may at the end of *Fifteen* Days from the day of the* [advertisement in the Gazette,] report the same, and make out the Bill in the usual manner for the grant of Letters Patent in Scotland or Ireland; but the Sign Manual of his Majesty is hereby dispensed with as far as it has been required in the granting such Letters Patent for Scotland or Ireland.†

XIII.

* depositing of the Petition.

† And the Seal appointed by the Treaty of Union in Scotland, and the Great Seal of Ireland, shall be forthwith appended to the said Letters Patent, the whole charge of fees and stamps for the same in each country respectively not exceeding £20. And that the said grant be also extended to all our Islands, Colonies, and Plantations abroad, if so required by the Petitioner, at a charge of £10.

21. [AND whereas Persons living in Scotland or Ireland may be desirous of obtaining Letters Patent for Scotland or Ireland, without taking out Letters Patent for England, or at least before they take out Letters Patent for England: BE it Enacted, That the Sign Manual of his Majesty the King shall not be necessary to warrant the proper Officer to fix the proper Seal to such Letters Patent, but the same may be affixed upon the Report of the Attorney or Solicitor-General for Ireland, or the Lord Advocate for Scotland.]

(See the concluding Clause.)

22. [AND be it further Enacted, That when a Person in Ireland has obtained Letters Patent in Ireland, or a Person in Scotland has obtained Letters Patent in Scotland, he may obtain a Certicate thereof.

(See the concluding Clause.)

XIX.

23. And whereas the Property in Letters Patent is unnecessarily abridged, without any corresponding advantage to the Public: BE it Enacted, That the Person or Persons to whom Letters Patent may have been granted, shall be at liberty to assign or transfer his or their interest in Letters Patent, or grant Licences to make or use the same, in any manner or to any number of persons he or they may think best for his or their own advantage.

XX.

24. AND whereas it sometimes happens that Patentees do not derive an adequate Profit from their Inventions during the Fourteen Years for which the Letters Patent have been granted: AND whereas there is no remedy but by an Act of Parliament, to enlarge the Term for which they were granted: BE it Enacted, That at any time* before that Term is expired, the Patentee, or his Assigns, may† obtain by Petition a Patent to extend the Term; and His Majesty is hereby authorized and empowered to grant

* not less than one year

† upon showing that he or they have not been enabled fully to carry the same Invention into effect, or to derive a reasonable Profit from the same.

Letters Patent of Extension, in the same manner as other Letters Patent for Inventions are to be granted; but the Attorney-General shall, with the assistance of the Examiners aforesaid, report upon the fitness thereof, and the terms upon which they ought to be granted, and all costs and expenses of making the necessary Report shall be paid and discharged by the Persons obtaining the said Letters Patent for an extension of the Term.

25. AND whereas great Delay, Inconvenience, and Expense, have arisen in consequence of a Patentee being often obliged to sue in a Court of Equity, whilst he has a Suit depending in a Court of Common Law: BE it Enacted, That the Plaintiff to a Suit in a Common Law Court may, by Motion in that Court, or from a Judge thereof, obtain an Order to stay the Defendant from making or using the Invention, unless an account be kept of the sale or use thereof, and also may obtain an Order to inspect the thing supposed to be a Piracy of the Invention.

XXI.

26. And be it further Enacted, that the Defendant may plead the General Issue, with which he is hereby bound to deliver a Notice of all the Objections and defences upon which he intends to rely at the trial of that Issue.

27. AND be it further Enacted, That the Venue in any Action may be changed, on Motion to the Court, from the County of Middlesex to the County in which the Witnesses reside.

XXII.

28. AND be it further Enacted, That either Party may obtain an Order of the Court, that the Sheriff do return, amongst the Special Jurors to serve on the Trial, Twelve Men practically skilled in the Arts and Sciences, and that each Party shall be at liberty

XXIII.

to challenge *Six* of them; and either Party may obtain an Order that the said Jurors may examine the Drawings and Models at least *Two* days before the day of Trial.

XXIV.

29. AND be it further Enacted, That every Defendant against whom a Verdict shall pass for the Infringement of a Patent, shall pay* *Three* times the amount of the Damages suffered by the Patentee, as it may appear by the proofs of the Patentee, or by the Account rendered as aforesaid by the Infringer. †

* double taxed Costs and

† to be assessed by the Jury.

30. [And be further Enacted, That Costs to be paid by either Party to the other Party shall include the Costs of Scientific witnesses, and also the Costs of making Experiments.]

XXV.

31. AND whereas Actions at Law may be brought upon Letters Patent after the Patentee has been unsuccessful in one Action and has had a Verdict recorded against him: AND whereas the present mode of Cancelling Letters Patent for Inventions by Scire Facias is dilatory and expensive; BE it Enacted, That if the Defendant in an Action on Letters Patent obtain a Verdict, which is not set aside by the Court in which the Action be depending, then the Defendant shall be at liberty to apply to the said Court for a Certificate, that the said Letters Patent ought to be cancelled; and the said Court is hereby empowered, on Motion to them made, if they think fit so to do, to grant a Certificate that the same ought to be cancelled, and the said Defendant may take the said Certificate to the Lord Chancellor, to whom it shall be a sufficient authority that the said Letters Patent be by him cancelled.

32. [And be it further Enacted, That if the Patentee obtain a a Verdict, the Court may in like manner, at its discretion, grant a Certificate that the validity of the Letters Patent has been fully

ried on the merits thereof, that in all future Actions brought upon those Letters Patent, the Patentee shall, upon production of the said last mentioned Certificate, be required only to prove the Infringement by the Party sued, and the Damages suffered, and nothing more.]	
33. AND be it further Enacted, That this Act shall come into force and take effect, as to the mode of obtaining Letters Patent, from the *First day of November in the year of our Lord One thousand eight hundred and thirty-three*; and that all the provisions therein contained shall, as far as they can, apply to all Letters Patent then in force, as well as to all Letters Patent then and thereafter to be granted.	XXVI.
34. AND be it further Enacted, That this Act shall extend* to Scotland and Ireland.	XXVII. * in all its provisions in like manner.

" That the following Gentlemen be appointed as a Committee, with Power to add to their Number, to watch the Progress of the Bill through Parliament, and to adopt such Measures thereon as they may see expedient:—

Mr. JONES
Mr. MACLEA
Mr. WORDSWORTH
Mr. DAVIS
Mr. WHITEHEAD
Mr. ROBINSON
Mr. WALKER
Mr. HALL
Mr. SADLER
Mr. EXLEY
Mr. FAIRBAIN
Mr. HATTERSLEY

" That a Subscription be immediately entered into to defray the necessary Expenses.

" That the thanks of this Meeting are justly due, and are hereby presented to Mr. Newton, of the Office for Patents, London, for his Assistance, and for the manner in which he has explained the different Clauses of Mr. Godson's Bill."

In the several Clauses of the Bill, with the proposed Amendments, be read in the order indicated by the Roman numerals, the subjects will arrange themselves as follow :—

I. Term of years for the duration of patent right.
II. Subjects for which patents shall be granted.
III. To whom to be granted.
IV. Permission to assign the right to take letters patent.
V. Preparatory specification to indicate the subject.
VI. Report of the Attorney or Solicitor-General.
VII. Board of scientific advisers.
VIII. Priority of patent right.
IX. Caveats to be entered against report to protect inventors.
X. Hearings on caveats.
XI. Adjudgment of prior right.
XII. Costs of letters patent.
XIII. That the same patent may be extended to Scotland, Ireland, and the Colonies.
XIV. To deposit a specification of particulars.
XV. Specifications to be examined and certified.
XVI. To deposit models, if necessary.
XVII. Claiming too much not to vitiate the whole.
XVIII. To correct specifications, if necessary, and insert improvements.
XIX. Assignment of patent right.
XX. Extension of the patent beyond the original term.
XXI. Injunction to stay a piracy.
XXII. To change the venue in suits.
XXIII. To summons competent juries.
XXIV. Cancelling improper letters patent.
XXV. When this Act to come into force.
XXVI. To extend to Scotland and Ireland.

At a Meeting of Merchants, Manufacturers, and others, Inhabitants of Birmingham, interested in the Patent Laws, held at the Public Office, Moor-street, on the 29th of March, 1833, Mr. B. Cook in the Chair, it was resolved unanimously—

" 1. That considering every new idea, whereof the manifestation or development may become useful to society, belongs exclusively to him who conceives it, and that it is highly advantageous to the useful arts and manufactures to encourage industry by securing the property of inventions to their authors at a moderate expense, this Meeting is of opinion that such security may be afforded at a considerably less cost than what is now payable as fees and stamps on the grant of Letters Patent.

" 2. That the Bill introduced into the House of Commons by Mr. Godson, 'To explain and amend the laws respecting Letters Patent for Inventions,' is defective in most of its provisions, and, if passed into a law, would fail to secure to inventors that protection and facility which it is the object of the Patent Laws to do.

" 3. That the Amendments now proposed to Mr. Godson's Bill be approved and printed, and that Mr. Newton, of London, be requested to wait upon Mr. Godson therewith, and endeavour to prevail upon him to adopt the same. viz.

Then follows the suggested Amendments, which correspond exactly in substance with those above recited, and scarcely differ in language, concluding with the resolutions :—

" 4. That, in the event of Mr. Godson refusing to adopt these Amendments, or such of them as appear to be of the most importance, a Petition be presented to the House of Commons embracing the spirit of the alterations now suggested.

" 5. That the following Gentlemen be appointed a Committee to superintend the progress of the Bill through Parliament, and to adopt such measures therein as they shall think expedient; and that such Committee have power to add to their number :—

Mr. B. Cook,
Dr. Church,
Mr. Van Wart,
Mr. Edward Lucas,
Mr. Horne,
Mr. Goddard,
Mr. C. H. Capper,
Mr. W. Richards,
Mr. F. Muntz,
Mr. R. Rotton.

" 6. That a Subscription be immediately entered into to defray the necessary expenses.

" 7. That the best thanks of this Meeting be presented to Mr. W. Newton, of the Office for Patents, London, for the interest he has taken in the subject, and for the able manner in which he has explained the same to this Meeting.

" 8. That Messrs. Tyndall and Rawlins be appointed Secretaries, to whom all communications are to be addressed.

Proceedings of the House of Commons on Mr. GODSON'S NEW PATENT LAW. Monday, 22nd April, 1833.

Mr. Godson, on moving the second reading of this Bill, observed, that as there appeared to be some diversity of opinion as to the nature of the remedies to be applied to the defects in the present system, therefore, although it would occasion considerable delay, he would merely move the second reading, that it might be seconded *pro forma;* and then he would move, that the Bill be referred to a Select Committee. This was agreed to, and Mr. Godson's motion, " That this Bill be referred to a Select Committee," was seconded by Mr. Philpotts, who made some observations in favour of the principle of the Bill. Sir Robert Inglis said, that if the Bill had not been referred to a Select Committee, he would most unquestionably have considered it his duty to oppose it. Mr. Warburton said he approved of the principle of the Bill, but admitted, that the details could certainly be best considered in a Committee; and he expressed his satisfaction that it was to be referred to a Select Committee. Mr. Goring made some observations upon the principle of the Bill, of which he expressed his approbation. Mr. Strickland also spoke to some of the clauses, which he thought could be amended. After one or two other Members had said a few words on the subject, the Bill was read a second time, and then referred to the following Select Committee :—

Mr. Lennard - - - - - - Member for Maldon.
Mr. Attorney General, Sir W. Horne - - Mary-le-bone.
Mr. Godson - - - - - - - Kidderminster.
Lord Viscount Oxmantown - Kings County.

Lord Viscount Howick	Northumberland, (North Division.)
Mr. Hume	Middlesex.
Mr. Roebuck	Bath.
Mr. Jervis	Chester.
Mr. Aglionby	Cockermouth.
The Lord Advocate	Of Scotland.
Mr. Handley	Newark.
Mr. Heathcoat	Tiverton.
General Fergusson	Nottingham.
Mr. Edward Romilly	Bridport.
Mr. Pease	Durham County.
Mr. Lynch	Galway.
Mr. William Roche	Limerick.
Sir George Caley	Scarborough.
Mr. Lloyd	Stockport.
Mr. Brotherton	Salford.
Mr. Poulettt Thompson	Manchester.
Mr. Solicitor-General	Dudley.
Lord Lumley	Nottingham County, (North Division)
Lord Viscount Duncannon	Nottingham.
Mr. Robert Grant	Finsbury.
Mr. Warburton	Bridport.
Mr. Hill	Kingston upon-Hull.
Mr. Rotch	Knaresborough.
Mr. Pollock	Huntingdon.
Mr. George Vernon	Derby County, (South Division.)
Mr. W. Gladstone	Newark.
Mr. Strutt	Derby.
Mr. Robert Ferguson	Kirkcudbright.
Mr. Hughes Hughes	Oxford.
Mr. Maurice O'Connell	Tralee.

Mr Cornelius O'Bryen - - - Clare County.
Mr. Philpots - - - - - - Gloucester.
Mr. Briggs - - - - - - - Halifax.
Mr. Hyett - - - - - - - Stroud.
Mr. Strickland - - - - - - York, (West Riding.)

Ordered, that Five be the Quorum of the said Committee.

J. H. LEY,

Cl. Dom, Com.

List of Patents

Granted by the French Government from the 1st of October to the 31st of December, 1832.

PATENTS FOR FIFTEEN YEARS.

To Mr. Merckel George Etienne, represented by Mr. Perpigna, of the French and Foreign Office for Patents, Rue-Neuve, St. Augustin, No. 28, Paris, for a machine to cut pryrogenous matches.

— Pinet, Jean Isidore, mechanician, for a new method of weaving silks and threads on a circular system.

— Wayte, William, of London, for improvements in steam engines.

— Pinson, Regulus Barra, pearl-manufacturer, of Paris, for the application of the substance used for colouring pearls to the ornamenting of various articles.

— Callet, Antoine Claude Jean, for a new system of evaporation applicable to various purposes.

To Mayniel, Antoine, of Bordeaux, for a machine for facilitating the action of breathing when under water, or surrounded by dangerous effluvia.

— Tourneyron, Benvit, for a new hydraulic wheel.

— De Girard, Jean Frederick Henri, of Varsan, for a new series of machines for bruising, combing, and spinning flax.

— Don, Thomas, and Ragon, Jean Baptiste Marie, for a new system of rail-roads.

— Christian, Theophile Victor, Joseph, for a new and complete system of spinning and milling silk weft, organzine, or other silk threads.

— Kiechlin Andri, and Co. of Mulhauzen, for an improved machine for spinning cotton and other fibrous substances.

— Gauthier, Jacques Joseph, of Beaumotte, for improvements in the method of refining iron.

— Blum and Moneuse, of Dijon, for the application of mineral oils obtained by distilling coal, for the purpose of lamp oils, with a sort of lamp suited to that effect.

— Starling Benson, of London, for a new method of preserving timber from the dry rot.

— Rowe Danson, of London, for an improved machine for manufacturing pins by a continual motion.

— Jean l'Heuillier, Louis Joseph, of Paris, for a new stove for burning coal.

PATENTS FOR TEN YEARS.

— Lebec, Pierre Jacques, of Nantes, represented in Paris by Mr. Perpigna, of the French and Foreign Office for Patents, Rue-Neuve St. Augustin, No. 28, for an improved spinning machine.

— Despruneaux, Gabriel, for an apparatus calculated to conduct fluids, called by him Fluiduct.

— Manesse Mallet, and Co. for machines for cutting nails without loss of the substance employed except for pin nails.

— Shalkland, of New York, for a machine for spinning flax, hemp, wool, and other fibrous substances.

To Monfray, Antoine Eugene, of Monrille, for a machine for stiffening and drying the warp used in weaving.

— Ingold, Pierre Frederic, of Paris, watchmaker, for an escapement with a constant power, and a compensating lever or balance.

— Manesse Mourolt, of Paris, for waterproof shoes and boots with moveable heels.

— Barde, Fulcrand Antonie, of Paris, for a new method of taking the measure of gentlemen's clothes.

— Malignon, Louis Charles, of Rouen, for a mechanical apparatus to regulate the velocity of coaches and waggons on rail or other roads.

— Martin and Brillantais, of Paris, for a method of substituting to pieces of timber or iron, which are to bear great weights, pieces of the same materials but of smaller dimensions, and which by their construction can bear a greater pressure.

PATENTS FOR FIVE YEARS.

— Muoud, Abraham, of Paris, represented by Mr. Perpigna, of the French and Foreign Office for Patents, for a method of rendering leather soft, and at the same time waterproof.

— Rieussec. Nicolas Mathew, watchmaker, of Paris, for an improved cart for measuring and delivering wood.

— Madden, John Byrne, of Passy, for an improved dragging or excavating machine.

— Deharte, Nicolas, of Solesme, for an improved lamp, called by him Heliostat.

— Sailly and Lelong, for a method of making fringe or frames not used before for that purpose.

— Hugonnet, Jean Pierre, mechanician, of Paris, for improvements on the Jucquart frames.

— Charpentier, Louis, and Munchs, of Paris, for a new guitar, called by them Multicord.

— Riottot, Louis Charles, for an improved pencil case.

— Thouvenin, Joseph, for applying to the ornamenting of picture frames, the process used for binding books.

To Pellet, Jacques, of Lyons; for a new method of printing stiff silks or ribbands.

— Petey, Louis Marie Alexandre, for an improved water closet.

— Declusel, and Duguet, father and son, for improvements on the Jacquart frame.

— Hellot, Remi, of Rouen, for improvements, which lessen considerably the friction in machinery.

— Paschal Jean Claude, of Lafertesous Jouarre, for an improved bedstead.

— Aribert, Victor, of Meus, for a method of baking bread by means of hot air.

— Rogeat, Joseph, of Lyons; for improved stoves for the purpose of working and warming apartments.

— Kolbe, George, of Strasbourg, for a method of obviating the inconvenience arising from the use of steelyards in weighing goods.

◆

New Patents

SEALED IN ENGLAND.

1833.

To Joshua Horton, of Taylor's Dock, Birmingham, boiler manufacturer, for his invention and improvement in the manufacture of wrought iron chains applicable to various purposes.—Sealed 23d March—to inroll specification within 6 months.

To John Joyce, of South Row, New Road, St. Pancras, in the county of Middlesex, gentleman, for an invention of certain improvements in machinery for making nails, being a communication made to him by a foreigner.—Sealed 28th March—6 months for inrolment.

To John White, of the town of Southampton, engineer and iron founder, for his invention of certain improvements in machinery, to be worked by steam or other power applicable to raising water, and to other purposes.—Sealed 28th March—6 months for inrolment.

To Charles Terry, of Shoe-lane, in the city of London, merchant, for his invention of improvements in producing leather from hides and skins.—Sealed 28th March—6 months for inrolment.

To John Obadiah Newell Ruther, of Lymington, in the county of Southampton, wine merchant, for his invention of an improved process for generating heat applicable to the heating of boilers and retorts, and to other purposes for which heat is required.—Sealed 30th March—6 months for inrolment.

To William Shilton, of Birmingham, in the county of Warwick, machinist, for an improved apparatus or machine for cutting files and rasps.—Sealed 3d April—6 months for inrolment.

To Edward Boys, Jun. of Rochester, in the county of Kent, gentleman, for his invention of a machine or apparatus for preventing accidents with carriages in descending hills, or in other perilous situations.—Sealed 4th April—6 months for inrolment.

To George Rodgers, of Sheffield, in the county of York, merchant, and John Tatam, of Hilton, in the county of Derby, gardener, for their invention of an improved button.—Sealed 4th April—6 months for inrolment.

To Joseph Gibbs, of the Kent Road, in the county of Surrey, engineer, for his invention of improvements in the means, apparatus, and machinery for exhibiting scenery, paintings, or certain descriptions of pictures.—Sealed 4th April—6 months for inrolment.

To John Ericsson, of Albany-street Regent's Park, in the county of Middlesex, civil engineer, for his invention of an engine for producing motive power, whereby a greater quantity of power is obtained from a given quantity of fuel than heretofore.—Sealed 4th April—6 months for inrolment.

To Claude Marie Hilaire Molinard, of Bury-street, St. Mary Axe, in the city of London, merchant, for an invention of certain improvements in looms or machinery for weaving fabrics, being a communication from a foreigner.—Sealed 9th April—6 months for inrolment.

To George Washington Wilds, of Coleman-street, in the city of London, merchant, for his invention of certain improvements in machinery for cutting marble and other stones, and cutting or forming mouldings in grooves thereon—Sealed 15th April—6 months for inrolment.

To James Smith, Jun. and Francis Smith, both of Radford, near Nottingham, machinists, for their invention of certain improvements in certain machinery for manufacturing lace, commonly called bobbin net lace.—Sealed 15th April—6 months for inrolment.

CELESTIAL PHENOMENA, FOR MAY, 1833.

D.	H.	M.	
1	0	0	Clock after the Sun 3 m. 3 s.
	—		Sun rises 4 h. 34 m. sets 7 h. 21.
	—		Moon rises 4 h. 7 m. p.m. sets 3 h. 59 m. A. M.
	—		Moon passes the meridian 10h. 23 m.
2	18	0	☿ in Aphelio
3	12	46	Ecliptic opposition or ○ full moon.
5	0	0	Clock before the Sun 3 m. 30 s.
	—		☉ rises 4 h. 27 m. sets 7 h. 27 m.
	—		☽ rises 9 h. 16 m. P. M. sets 5 h. 31 m. A. M.
	—		☽ passes the mer. 13 h. 47 m.
			Mer. R. A. 1 h. 22 m. dec. 5. 43. N.
	—		Ven. R. A. 3 h. 58 m. dec. 25. 30. N.
	—		Mars R. A. 7 h. 8 m. dec. 24. 10. N.
	—		Jup. R. A. 1 h. 15 m. dec. 6. 43. N.
	—		Sat. R. A. 11 h. 33 m. dec. 5. 34 N.
	—		Georg. R. A. 21 h. 40 m. dec. 14. 44. S.
	—		Vesta R. A. 19 h 22. m. dec. 18. 47. S.
	—		Juno R. A. 15 h. 14 m. dec. 2. 5 S.
	—		Pallas R. A. 2 h. 55 m. dec. 3. 0. S.
	—		Ceres R. A. 4 h. 30 m. dec. 21. 30. N.
10	0	0	Clock after the ☉ 3 m. 50 s.
	—		☉ rises 4 h. 18 m. sets 7 h. 35 m.
	—		☽ rises 1 h. 0 m. A. M. sets 9 h. 20 m. A. M.
	—		☽ passes mer. 17 h. 59 m.
11	6	47	☽ in □ or last quarter.
11	11	0	☽ in Apoge.
13	0	0	☿ Elong. max. W. 23, 25
	—		○ And ♅ in quartile.
15	0	0	Clock after the ☉ 3 m. 56 sec.
	—		☉ rises 4 h. 11 m. sets 7 h. 42 m.
	—		☽ rises 3 h. 5 m. A. M. sets 2 h. 49 m. P. M.
	—		☽ passes the meridian 8 h. 5 m.
16	8	7	☽ in conj. with ♃ long. 22. ☽ lat. 5. 4. S. ♃ lat. 1. 7. S. diff. of lat. 3. 57.
	20	0	☽ in conj. with ♀
17	0	14	☽ in conj. with ☿ long. 31. ☽ lat. 4. 57. S. ☿ lat. 3. 16. S. diff. of lat. 1. 41.
18	19	55	☽ in conj. with ♀ long. 55. ☽ lat. 4. 13. S. ♀ lat. 2. 32. N. diff. of lat. 6. 45.
19	1	39	Ecliptic conj. or ● new moon.
20	20	45	☉ enters Gemini.
20	0	0	Clock after the ☉ 3 m. 47 s.
	—		☉ rises 4 h. 4 m. sets 7 h. 50 m.
	—		☽ rises 4h. 56 m. A. M. sets 8 h. 54 m. P. M.
	—		☽ passes mer. 0 h. 54 m.
23	0	0	♄ Stationary.
5	18	0	☽ in conj. with ♂ long. 116 ☽ lat. 40. 0. N. ♂ lat. 1. 30. N. diff. of lat. 50.
24	6	0	in Perige.
25	0	0	Clock after the ☉ 3 m. 25 sec.
	—		☉ rises 3h. 58m. sets 7 h. 56 m.
	—		☽ rises 9 h. 53 m. A. M. sets 0 h. 40 m. A. M.
	—		☽ passes the meridian 5h. 44m.
25	0	0	Mer. R. A. 2 h. 40 m. dec. 12. 42. N.
	—		Venus R. A. 3 h. 15 m. dec. 18. 59. N.
	—		Mars R. A. 7 h. 59 m. dec. 22. 11. N.
	—		Jupiter R. A. 1 h. 31 m. dec. 8. 20. N.
	—		Saturn R. A. 11 h. 32 m. dec. 5. 37. N.
	—		Georg. R. A. 21 h. 41 m. dec. 14. 41. S.
	—		Vesta R. A. 19 h. 29 m. dec. 19. 22. S.
	—		Juno R. A. 14 h. 58 m. dec. 0. 44. S.
	—		Pallas R. A. 3 h. 33 m. dec. 1. 50. S.
	—		Ceres R. A. 5 h. 6 m. dec. 23. 17. N.
25	22	40	☽ in □ or first quarter.
26	0	0	♅ Stationary.
27	2	30	☽ in conj. with ♄ long. 171. ☽ lat. 4 39. N. ♄ lat. 2. 20. N. diff. of lat. 2. 19.
28	18	0	♀ in the South node.
29	0	0	☿ in conj. with ♀ long. 47. ☿ lat. 2. 12. S. ♀ lat. 0. 2. S. diff. of lat. 2. 10.

Eclipses of Jupiter's Satellites are not visible at London this month.

J. LEWTHWAITE, Rotherhithe.

METEOROLOGICAL JOURNAL,

FOR APRIL AND MAY 1833.

1833.	Thermo.		Barometer.		Rain in inches
	Hig.	Low	Hig.	Low.	
March					
26	40	27	29,84	29,76	
27	42	29	29,96	29,86	,325
28	42	26	29,98	29,95	
29	42	28	29,99	29,93	
30	41	29	29,95	29,81	
31	52	26	29,73	29,61	
April.					
1	52	40	29,25	29,06	,125
2	54	42	29,20	29,08	,25
3	56	44	29,53	29,40	,075
4	53	40	29,63	29,55	
5	51	39	29,91	29,79	,025
6	57	40	29,93	29,80	,025
7	57	31	29,87	29,83	
8	51	33	29,98	29,89	
9	52	29	30,02	29,94	
10	55	38	29,77	29,52	,05
11	46	36	29,41	29,30	
12	47	37	29,41	29,32	,05
13	51	33	29,69	29,59	,075
14	49	36	29,55	29,47	,1
15	50	27	29,43	29,30	,25
16	45	29	29,42	29,31	,425
17	50	29	29,53	29,52	,025
18	48	27	29,70	29,62	,075
19	51	26	29,96	29,86	,025
20	54	29	30,07	29,98	,025
21	59	31	30,11	30,08	,025
22	60	32	30,13	Staty.	
23	59	31	30,13	30,10	
24	57	39	29,99	29,93	,025
25	58	41	30,09	30,01	,052

Edmonton. CHARLES HENRY ADAMS.

Latitude 51° 37 32 N.
Longitude 3 51 West of Greenwich.

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THE

London

JOURNAL OF ARTS AND SCIENCES,

AND

REPERTORY

OF

PATENT INVENTIONS.

No. XIV.

CONJOINED SERIES.

Recent Patents.

To WILLIAM NEWTON, *of the Office for Patents, Chancery Lane, in the county of Middlesex, civil engineer, and mechanical draftsman, for an invention communicated to him by a foreigner residing abroad, of an improved apparatus for producing instantaneous light, and the means and mechanism to be employed in the manufacture of the same.*—[Sealed 10th August, 1832.]

THIS improved apparatus for producing instantaneous light consists of TWO *parts*—FIRST, a peculiar construction of valve or plug, to be inserted in the neck of a bottle containing sulphuric acid or other chemical liquor, capable of igniting any combustible matter attached to the end of a match; SECONDLY, a peculiar mode of manufacturing matches to be ignited by the chemical action of sulphuric acid, or by any other CHEMICAL OR MECHANICAL AGENCY. The means and machinery to be employed in the manufacture of the same will be described after the peculiarities of the chemical bottle and igniting matches have been explained.

The bottles which I employ, I prefer to be made of glass, and they may be of any form and dimensions which convenience or taste shall dictate. The chemical agent to be contained in the bottle for igniting the matches may be sulphuric acid, or any other liquid that would effect the purpose.

In the Plate XIII, fig. 1, represents the section of a bottle, with the improved plug or valve *a*, inserted in its neck. Fig. 2, is the plug itself detached from the bottle, shown in two views. These may be supposed to be represented half the real size. I prefer to make this plug of lead, and I form it by means of a stamping press, with dies capable of giving it a cup shape or recess on the upper surface, and a convexity on the lower surface, the sides being as the frustrum of a cone slightly tapering downwards. One or more very fine holes are to be pierced through the plug, to allow the chemical liquor within the bottle to pass through into the cup.

The leaden plug being formed and pierced as described, and the neck of the bottle at the inside ground to the proper shape, that is slightly conical, and left rough, the proper quantity of chemical liquor is put into the bottle, and then the plug is inserted at its mouth, and being pressed down into its neck by force, it will be found to adhere firmly to the neck of the bottle as a stopper, and prevent the liquor from flowing out.

In employing this apparatus, the bottle is to be first slightly shaken, when a small quantity of the chemical liquor will hang as a globule to the convex under part of the plug, a portion of which globule of liquor, by capillary attraction, will pass upwards through the small holes of the plug into the cup or concavity above, and this effect will be promoted or expedited by the warmth of the hand holding the bottle, which will expand the air within and tend to force the liquor up through the small holes into the concavity of the plug. The small quantity of chemical liquor thus obtained in the cup will be sufficient to ignite a match, the end of which has been prepared in the usual way with one of those chemical compositions (as chlorate of potash and sulphur) that produce combustion as soon as acted upon by sulphuric acid or other chemical liquor; the nature and properties of which chemical agents are well known, and therefore need not be particularly described, as they are not to be considered as forming any part of the present invention.

A ground glass stopper may be inserted into the mouth of the bottle above the plug, to prevent the atmosphere from acting upon the acid, or a cap may be placed over the mouth of the bottle with an elastic pad made of glue and treacle, or any other suitable matter which shall keep the bottle air-tight; I do not, however, claim this as part of the invention, as it may have been employed before for a similar purpose: nor do I consider such a stopper altogether essential, as the fineness of the holes in the plug (which will be generally filled with the liquor) will, in a great measure, if not completely, preclude the passage of atmospheric moisture to the interior of the bottle; but the small quantity of acid retained in the cup of the plug in the bottle's neck may become diluted by moisture from the atmosphere, and will, in that event, perhaps require to be occasionally wiped out before the ignition of the matches could be effected.

The matches to be employed in connexion with these bottles may be either such as will produce a flame for lighting a candle, or a slow fire for smokers.

The first of these I make from thin waxed tapers by the following means:—I combine about six or eight threads of fine cotton yarn slightly twisted, and draw them through melted wax in a pan or vessel, exactly in the way that wax tapers are usually made; that is, I wind a considerable length of these combined yarns upon a reel, and then pass the end of the yarns into the pan or vessel containing melted wax, under a rod placed across the pan for the purpose of keeping the yarns immersed. The fluid wax adhering to the combined yarns forms the taper, and in order to render it smooth and equal in thickness, the taper is conducted through a small hole in a metal plate, which acts as a draw plate, scraping off the superfluous wax as the taper is drawn through by the rotation of a receiving drum. Passing the taper about three times through the melted wax and draw plate, will be sufficient to make it of the proper substance; but the taper should be pressed by a wet cloth as it proceeds from the draw plate the last time, for the purpose of giving it a polish previously to cutting it into lengths for matches.

There may be other compounds besides wax used for making these tapers, such as resin and tallow; and if it should be required, the matches may be made to give out fragrant perfumes while burning, by the introduction of essential oils or other perfumes into the melted material of which the tapers are made.

In order to cut these tapers into suitable lengths for matches, they are to be first wound upon reels or bobbins of large diameter, and these reels or bobbins being placed in convenient situations, the tapers are progressively drawn off by the operations of the cutting machine placed near to the reels.

Fig. 3, is a side elevation of the cutting machine, and the frame holding the reels; fig. 5, is a plan or horizontal view of the same; *a, a, a,* are the side frames in which the reels or bobbins *b, b, b, b,* carrying the lengths of taper, are mounted; *c, c, c, c,* are four axles, on each of which twenty or any other desirable number of bobbins turn loosely, and from the respective bobbins the lengths of taper are led off to the cutting machine.

When any of the bobbins require to be recharged, all the bobbins on one axle are to be raised by means of blocks or wedges *d, d, d, d,* brought against their peripheries, so as to support them free of their axles; the axle *e, e, e, e,* may then be drawn out, and the situation of the empty bobbin replaced by a full one, and the axle being again introduced, and the blocks lowered, the bobbins will be free to turn as before, and give out the length of taper.

All the tapers from the four sets of reels are brought forward to the cutting apparatus, as shown in figs. 3 and 5; and are respectively passed through small holes in two perforated plates *f, f,* placed upon the table *g,* for the purpose of straightening the length of taper previously to their being cut into matches.

For the more perfect illustration of the construction and operation of the cutting machine, its principal parts are shown on an enlarged scale in the two sectional views, figs. 6 and 7.

The ends of all the tapers having been brought forward through the plates *f, f,* they are then conducted through the perforated guide blocks *h,* and guide rack *i,* shown partially in the two detached front views at figs. 8 and 9.

These guide blocks *h,* and guide rack *i,* are stationary during the working of the machine, and are in connexion with a pair of claws or holders *k* and *l,* mounted in the adjustable frame *m*, which frame is held fast to the standard of the machine by the screws *n*, working in the collar boxes *o*.

The situation of the claws or holders will therefore depend upon this screw *n*, which may be turned by a key placed upon the end of a shaft *p*, carrying endless screws that work into oblique toothed wheels fixed upon the heads of the screws *n*. The upper chap *k*, of the claws or holders rises and falls in the frame *m*. It is supported by a pin in the right angle lever *q*, *q*, which is connected by a joint to the bent counter lever *z*, *z*. These parts are best seen in the front view of the machine at fig. 10. By means of this counter lever *z*, the upper chap of the claws is raised, as at fig. 6, and it is kept in this elevated position by a bolt passed through a hole in the lever *q*, shown at *s*, in the side view, fig. 3.

When this bolt *s*, is withdrawn from the lever *q*, a weighted rod *l*, causes the lever, with the upper chap, to fall and pinch all the tapers between the claws *k* and *l*, as shown in the section at fig. 7. This falling of the upper claw not only holds firmly all the tapers that have been passed through the guides *h*, and *i*, but also bruises them for a purpose which will be explained.

Before commencing the operation of cutting the tapers, their ends are all brought forward beyond the cutter, which is mounted in the sliding frame *u*, *u*. A guide plate *v*, figs. 6 and 7 (shown also in the partial front view, fig. 11), is affixed to the sliding frame, and all the tapers pass through it, and extend over the bed or block *w*.

The piece *x*, is a bar of iron extending across the machine, which is intended to move up and down in the frame *u*. At the lower part of this bar *x*, the toothed plate *y*, is fixed, which toothed plate is shown in the partial front view at fig. 12. The bottom edge of this bar *x*, is slightly bevelled, as also is the top of the block *w*, in the opposite direction, the object of which is to cause the tapers to be pinched and held firmly between the two surfaces, in order that they may, by that means, be all drawn forward when the sliding frame *u*, advances. Another bar *z*, contiguous to *x*, also slides up and down in the frame *u*, and to the lower part of this bar a steel blade or cutter a, is affixed, by the operation of which, against a projecting edge of the block *w*, the required lengths of tapers are cut off for matches.

The bar *x*, which slides in the frame *u*, is moved up and down by a lever b, b, to which its upper part is attached by a pin or joint; the other bar *z*, slides also up and down in the frame *u*, in a similar manner, by the agency of the lever c, c, to which it is likewise attached by a pin or joint. The fulcrums of both these levers are pins passed through ears on the top of the frame *u*, and the lever has a loggerhead or weight to balance it, and keep up the cutter. A rack d, is secured to the sliding frame *u*, and, by means of a pinion e, on the shaft f, the sliding frame *u*, is moved to and fro.

The parts of the machinery being situate as represented in fig. 6, that is, the sliding frame *u*, being brought up as near to the frame *m*, as the end of the adjusting screw *n*, (which acts as a stop) will allow, the operation may commence. The first movement of the machinery is to depress the lever b, (see figs. 5 and 10), which may be done by the hand of the workman: this brings down the bar *x*, and causes all the tapers to be pinched between the two bevel edges of *x*, and *w*. By now turning the winch g, a pinion on its axle, taking into a toothed wheel h, on the shaft f, of the pinion, moves the rack d, and thereby draws back the sliding frame *u*, until it is stopped by the piece i, at the under part of the frame striking against the adjusting screw k, which regulates the distance that the sliding carriage shall run out, and consequently the lengths of the matches.

Before, however, that the sliding frame has reached the end of its journey, a pin l, in the side of the disc m, fixed upon the shaft f, passes under the horizontal arm of the double lever n, and raises it up, the reverse end of this double lever being attached by a clutch l, to the bolt s. The bolt is, by these means, drawn back out of the hole in the bent lever *r*, when the upper clamp *k*, immediately falls, and takes fast hold of the tapers.

Immediately after the falling of the clamp *k*, the workman depresses the lever c, by a smart stroke of the hand, which causes the cutter a, to cut off all the ends of the tapers projecting beyond the cutter d, and this being the first stroke of the machine, these ends fall as waste. The further progress of the rack and sliding frame which brings it up to the stop i, causes the bevel edges of the holders *x*, *w*, to scrape off that small portion of wax which covers the ends of the tapers, (and which should have been previously bruised by the falling of the upper chap *k*, of the clamps *k*, and *l*,) thereby exposing the fibres of each, and spreading the wick out flat. The narrow apertures, however, of the toothed plate *y*, through which the ends of the taper pass, bring the fibres of the wick again together into a round form, and hence prepare them to receive the inflammable composition into which the ends of all the matches must be dipt to render them capable of ignition.

One stroke of the machine being now complete, the bars *x*, and *z*, must be raised, and the winch g, being then turned the reverse way to its former movement, the sliding frame with the cutter, will be carried back to the situation shown at fig. 6.

The upper chap *x*, of the pincers is now depressed as before, and the tapers are consequently taken fast hold of between the two surfaces *x*, and *w*. The workman then raises the lever *r*, until the hole in that lever comes opposite the bolt *s*, when the weight at the end of the lever n, projects the bolt into the hole, and the upper chap *k*, is thereby held up as in fig. 6. Now by turning the winch g, as first described, the sliding frame moves forward as before, drawing out the lengths of taper for the matches until the chap *k*, has again fallen, and stopped the further progress of the tapers. Then before the cutter is depressed a pair of portable spring clamps or holders are brought into the situation shown by dots at A, in fig. 7; for the purpose of receiving the matches, and being pressed together, they take hold of all the ends of the tapers, which, when cut off by the depression of the cutter as before directed, are by the clamps prevented from falling.

The whole range of matches across the machine, being thus held securely between the clamps, they are hence removed to have their ends dipt in the inflammable composition, and are afterwards hung up to dry in suitable racks or frames.

To bring forward another length of taper, and to cut off another series of matches, precisely the same operation is to be repeated, and continued until the working is stopped.

Should the guide pieces *h* and *i*, and the lower piece *l*, of the chaps require cleaning from the wax which is scraped off as the tapers pass through them, they may be moved back from out of the frame *m*, by means of the racks o, o, and pinions p, p, upon the shaft q.

The construction of the portable spring clamps or dipping holders is shown at figs. 13, to 18. Straight bars of wood or metal *a*, *a*, equal in length to the width of the machines are covered on their inner edges with leather or other soft material: they are connected together by two pins *b*, *b*; the upper bar slides from the lower one upon these pins, and they are kept asunder by a slight helical spring twisted round each pin, and acting between the bars.

When about to be applied to the machine to take hold of the matches, the bars are open, as at fig. 13. The holders are then brought into that situation before the machine, which allows the ends of the tapers to project between the bars, and being then pressed together by the fingers of the person holding them, they close, and take hold of the tapers; a little catch *c*, *c*, at each end of the bolts *d*, *d*, stopping against a ledge under the head of each pin, as shown at fig. 14. Fig. 15, is a top view of the holder; fig 16, one of the bars detached; and figs. 17, and 18, are transverse sections of the holder.

The materials for making the inflammable composition being mixed up with water into a fluid state, this fluid is placed in a shallow flat dish; and the holders being brought over the dish, the ends of the matches are dipped in, and then the holders are hung up for the dipped matches to dry. When the composition has become hard and dry, the matches may be let fall from the holders by pressing the nibs *e*, *e*, of the sliding bolts *d*, *d*, between the finger and thumb, which compresses the spring *f*, between the sliding bolts, and disengages the catches *c*, *c*, from under the heads of the pins *b*, *b*, when the bars are immediately thrown open.

Although I have described that the lever b, used for closing the pieces *x* and *w*, for pinching and drawing the taper into the machine, together with the lever c, used for depressing the cutting piece *z*, and effecting the separating of the lengths of taper, and also the moving to and fro of the frames *u*, are to be worked by hand; yet it must be obvious to all competent mechanics that they may be actuated by other power than manual labour with good effect, as the duty they have to perform comes in regular periods with regard to the other operations of the machine; and that the lever, of the chaps *k*, and *l*, for holding and stopping the further progress of the taper, may also be raised by any convenient mechanism. In fact, the whole of the operations of the machine may be performed without the attendance of a workman, except for the purpose of applying the portable dipping holders to the machine, to receive the matches as they are cut off from the ends of taper, and removing them to be dipped; but I have not thought it necessary to describe particularly such mechanism, as it may be effected by cranks, rods, levers, and cams, or other means, in various ways, the effective working of the operative parts of the machine being exactly the same as the machine herein described. It will also be evident, from the foregoing description, that the machine is capable of adjustment in various ways, to suit any convenient sized matches.

Should it be thought desirable to effect the cutting off the lengths of taper to form the matches, and the scraping off the wax or composition by hand, instead of using the machine, it may be done by a peculiar formed pair of pincers, capable of cutting one or more lengths at a time, as thought desirable. Fig. 19, is a side view of a pair of pincers capable of cutting off five lengths of taper, and showing the chaps open, and the length of taper introduced into them. Fig. 20, is a similar view, showing the chaps of the pincers closed, and the lengths of taper cut off. Fig. 21, is a front view of the mouth of the pincers; and fig. 22, is an inside or horizontal view of one of the chaps.

In using these pincers the ends of the tapers *a, a, a,* are introduced through the guide holes *b, b,* in front of the chap, as shown in the figures, their ends abutting against the stop piece *c,* upon the upper chap of the pincers (this stop piece is adjustable to suit several different lengths of matches by moving it along the upper chap); *d, d,* are the cutters which seperate the lengths of taper; *e, e,* are two projecting edges, which press upon the taper as the cutters *d, d,* are effecting their operation; and as the pincers are drawn by the workman from the ends of the tapers, these projecting pieces scrape off the superflous wax from the end of the lengths of taper, as described in the operation of the machine, ready to form the dip ends of the next matches, thereby cutting off one set of matches, and scraping off the wax from the end of the next; the guide holes *b*, *b*, again rounding the taper after it has been pressed flat.

The tapers may be led through a guide plate fixed upon a table, and project out so that the workman may close upon them, and cut them off rapidly, their being a small lever and pair of claws to hold the tapers, and answer the purpose of the claws *k* and *l*, in the machine.

For manufacturing matches which are to burn as fuzees or slow fires for smokers, I prepare the fibrous wicks by dipping them into a combustible material, as a solution of saltpetre with paste, and having obtained lengths of the wicks, I cut them into matches, receive them into holders, and dip their ends into the combustible materials for primings in the way described above.

Matches made from tapers in this way and by the same machinery, may also be prepared with priming of composition at their ends, which will ignite by friction; the ends of these matches, however, I prefer to leave flat, as they are delivered from the scrapers, as with flatted ends they will be better suited to be drawn between the rough surfaces which produce ignition. But I wish it to be particularly observed, that I do not claim any of the combination of combustible materials applied for priming as new, or forming any part of this invention; but the application to these improved taper matches of such materials or composition capable of igniting by friction I do consider to be new.

Lastly, I wish it to be understood that my claim of improvements under the above recited Letters Patent, are, first, the peculiar construction of plugs or stoppers for chemical bottles used for producing instantaneous light; and,

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Walmsly's Fur Cutting Machine.

Fig. 7.

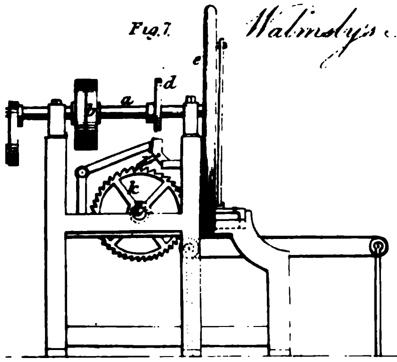
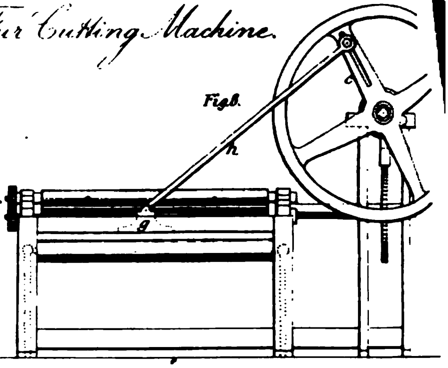


Fig. 8.



Gibbs & Applegath's Imp.d Steam Carriage.

Fig. 5.

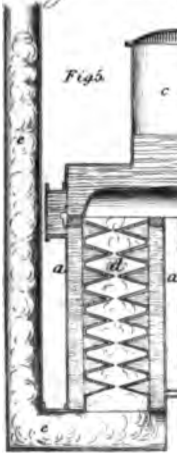


Fig. 4.

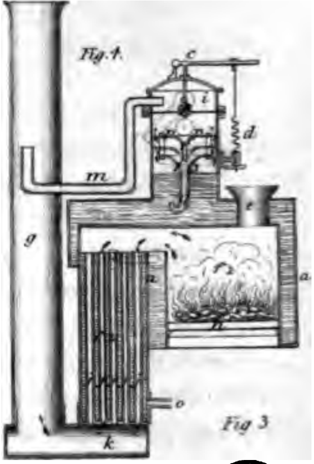


Fig. 6.

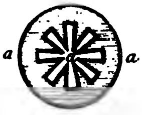


Fig. 3

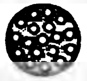


Fig. 1.

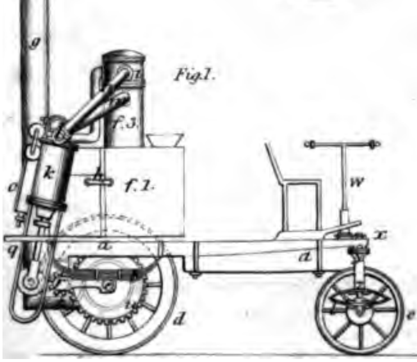
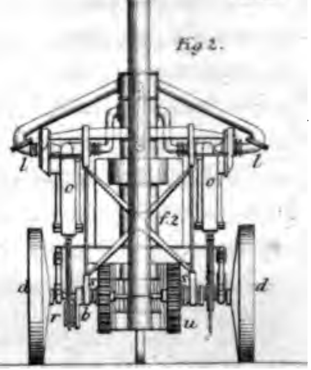


Fig. 2.



secondly, the peculiar method or methods above described, of making matches for the same purpose; and, thirdly, the machinery or apparatus employed in their manufacture.—*Inrolled in the Roll's Chapel Office, February,* 1833.

Specification drawn by Messrs. Newton and Berry.

The subjects of this Patent are now exercised solely by Messrs. Mosley and Bell, of Wandsworth, and Water Lane, Fleet Street, London.

To JOSEPH GIBBS, *of Kent Terrace, Kent Road, in the county of Surrey engineer; and Augustus Applegarth, of Crayford, in the county of Kent, calico printer, for certain improvements in steam carriages.*—[Sealed 29th September, 1832.]

IN plate XIV.* fig. 1, is a side view of a steam carriage, constructed as described by the Patentees in the specification of the above Patent: fig. 2, is an end view of the same; *a, a,* is a wrought iron frame work or carriage supported by springs *b, b,* connected with axle *c,* of the driving wheels *d, d,* and steering wheel *e.*

The boiler or steam generator *f, f, f,* is firmly secured to the carriage *a,* and consists of three parts, the body of fire box *f* 1, made of strong plate iron, containing the water in a double casing surrounding the fire; *f* 2, is a cylinder containing water, and filled with copper tubes about two inches in diameter, through which the fire and heated air pass from *f* 1, in a downward direction towards the chimney *g.* There is a connecting pipe *h,* to convey the water from *f* 2, to *f* 1, as shown in the figure; *f* 3, is the steam chamber or separator, where the steam is separated and collected from the water; *i,* is a waste steam chamber upon the top of the separator, into which the waste steam is conducted by pipes in its passage from the cylinders to the chimney; the safety valve is placed in this chamber.

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* Plate XIV. will accompany our next Number.

The construction of the various parts of this boiler will be better understood by reference to the sectional figs. 3, and 4, which will be described hereafter.

The cylinders of the engines *k*, *k*, are made in the usual manner, but move or vibrate in bearings *l*, fixed or suspended from the frame *a*. The cylinders are supported by, and vibrate upon, the steam pipes *m* and *n*, which are cast with the cover of the cylinders, and are made hollow to admit the passage of the steam into and from the cylinders in the manner frequently used in vibrating engines; *m*, are the pipes which convey the steam from the separtor *f* 3, into the cylinders; *n*, are the pipes which convey the waste steam from the cylinder to the chamber *i*; *o*, *o*, are the slide valves made in any of the usual constructions, and worked in the usual manner. The pistons of the cylinders are of the usual construction, and may be packed with metallic or other packing.

The ends of the piston rods carry friction rollers *p*, moving in the parellel guides *q*; the ends of the piston rods are connected with the arms or cranks *r*, firmly fixed upon the ends of the shaft *s*, turning in bearings suspended from the frame work. The crank arms *r*, are set at right angles to each other; and upon the shaft *s*, two toothed pinions *t*, *t*, are fixed; *u*, *u*, are two toothed wheels, which revolve freely around their axes upon the shaft or axle tree *c*, of the running wheels, and either of them can be occasionally connected with the shaft by means of clutches in the usual manner. The driving wheels *d*, *d*, are fixed upon the axle *c*, and the loose wheels *u*, *u*, are always in gear with the fixed pinions *t*, *t*; and as the wheels and pinions are made of different diameters, when either of them is connected with the axle tree *c*, a fast or slow motion will be communicated to the running wheels. The shaft *s*, and the axle tree *c*, are securely connected together by strong links or couplers *v*, which keep the teeth of the wheels *u*, and the pinions *t*, properly in gear. The springs *b*, *b*, are furnished with shackles at each end, in order that the action of the wheels and pinions may be influenced as little as possible by the motion of the spring. The shaft *s*, being connected with the frame work *a*, *a*, while the axle tree *c*, rises and falls with the springs, but in a curvilinear direction around the centre of the shaft *s*.

It should be observed that the shackles of the springs *b*, should be made of one piece of iron, and the pins should fit them and the springs exactly, to obviate side or swinging motion; and the teeth of the wheels *u*, and the pinions *t*, may be rounded at each end: the action of the machine will be evident by the figures. When steam is admitted into the cylinders, the pistons are alternately raised and depressed, which cause the crank arms *r*, and the spindle *s*, with its pinions *t*, *t*, to revolve; and on its clutches being connected with one of the toothed wheels *u*, already in gear with its corresponding pinion *t*, it is made to revolve and carry the axle tree *c*, round, and consequently the running wheels *d*, with it, thus causing the whole machine to advance.

The guiding or steering motion is produced in the usual manner, viz:—the upright shaft or rod *w*, is moved by means of handles at its upper end. At the lower end is a toothed pinion, which works into a toothed segment *x*, fixed upon the divided or forked support *y*, connected with the steering wheel *e*, by means of two pairs of elliptical springs *b*. The support *y*, moves in bearing on the end of the frame work *a*, and has a pair of steady plates *z*, to keep it upright.

The seat of the conductor is over the water tank, the upper side of which serves as a floor for the stoker. The boiler is supplied with water by a force pump, in the usual manner; and the waste steam is conveyed from the chamber *i*, into the chimney by means of the bent pipe, which projects three or four inches into the waste chamber.

Fig. 3, is a horizontal section of the boiler, partly described under figs. 1 and 2. Fig. 4, is a vertical section of the boiter with all its parts; *f* 1, is the body or fire box, which is surrounded by the double casings *a*, *a*, containing water; *g*, is the chimney; *i*, the chamber to receive the waste steam, as it blows off from the cylinders through the pipes *n*, *n*, described in figs. 1 and 2; *b*, is the safety valve, connected by a rod with the lever *c*, to which is attached the spring *d*, which may be regulated to the pressure required; *m*, is the pipe, which conveys the waste steam to the chimney; *e*, is the hopper, through which the fuel is supplied to the furnace; *h*, are the fire bars; *f* 2, is the cylinder which contains the copper tubes *j*, *j*, and through which the fire and heated air pass in a downward direction from the fire box *f* 1, to the passage *k*, leading to the chimney *g*, in the direction shown by the arrows.

The cylinder *f* 2, is made distinct from the fire box *f* 1, and has its top and bottom ends made of strong plate iron, into which the copper tubes are inserted and firmly fixed. The water in the cylinder *f* 2, communicates with the water in the double casings *a*, *a*, of *f* 1, through the pipe *x*, shown in fig. 1; *o*, is the feed pipe, which conveys the water from the force pump in the usual manner.

In *f* 3, is fixed the apparatus for separating the steam from the water; *p*, *p*, is a circular plate of copper, which goes across the interior of the chamber *f* 3, and is bent downwards in a conical form, as shown in the section; and as the steam rises from the surface, intermixed as it frequently is with boiling water, they pass together upwards in the direction of the arrows, and strike against the bottom of the circular plate *p, p,* which forces them back in a downward direction; the water, by its superior gravity, falls into the bottom funnel *q*, which returns it to the body of water; while the steam, being lighter, ascends between the circular plate *p*, and through the mouth of the top funnel *r*, into the upper part of the chamber *f* 3, whence it goes into the cylinders through the steam pipe; if any water should have passed with the steam into the upper part of the chamber *f* 3, it will return down the funnel *r*, by its own gravity, as in the upper part of the chamber the steam and water are in a state of less disturbance.

The top funnel *r*, and the bottom funnel *q*, are supported from the circular plate *p*, by means of four rods.

When constructing a locomotive engine for propelling another vehicle for the conveyance of passengers, the Patentees propose that the steering wheel and the guiding apparatus should be removed from the locomotive engine carriage, and placed in front of that for carryng the passengers; and when the engine is used for drawing carriages containing goods, they are to be attached to the hind part in the usual manner.—*Inrolled in the Inrolment Office, March,* 1833.

Specification drawn by the Patentee.

To John Christopher Tobias Kreeft, *of Old Broad-street, in the city of London, merchant, in consequence of a communication made to him by Stephen Von Keesz; and Moritz Von Ischoffen, foreigners, residing abroad, for an invention of an improved apparatus for shaping plates of metal, and for manufacturing various articles therefrom.*—[Sealed 22d December, 1831.]

This invention consists in an apparatus by which plates of metal are pressed into various forms, for the purpose of manufacturing articles in common use. A powerful lever is employed, into which the tools required for shaping or forming the articles are fixed. The tools are made to take effect while the plates of metal are made to revolve in a horizontal direction, the plates being kept firmly secured upon a revolving bed prepared for them.

Plate XI. (given in our previous number) fig. 5, is a side elevation of one of the improved apparatus, the frame work being partly removed, the better to expose the mechanical parts. Upon the main shaft *a*, is a fly-wheel having a winch handle turned by manual labour or other means; this shaft turns in bearings or plummer boxes, and carries on it the beveled pinion *b*, which takes into the horizontal beveled wheel *c*; these wheels are thrown in or out of gear by sliding the shaft in its bearings.

The wheel *c*, is fixed on the upright spindle *d*, which is provided with both a slow and quick motion:—the first is derived from the bevel gear, and the latter from the driving pulley *e*, having a band leading from a large driving wheel of about 4 or 5 feet in diameter. The spindle *d*, turns at its lower end on a bearing or gudgeon, and its upper end passes up through the platform or table of the frame, and through the brass collar; at the upper end of the shaft is a screw, on which the various moulds or dies required to perform the various works are screwed, as at *g*; these dies are made of cast iron; those which are raise are called moulds, and those which are sunk are called dies. The die shown in the figure being such a one as would be used to form a soup plate; *h*, *h*, are hold fasts, any convenient number being used for holding down the metal plate to be operated upon, four are generally found sufficient; the hooks of the hold fasts are formed so as to catch over the edges of the plate of metal; *i*, is a standard firmly fixed into the frame, having a slide carriage *j*, with a swivel rest or bearing for one end of the lever before mentioned to act in; this slide is adjustable to any required height on the standard, and secured by a screw, and forms the fulcrum of the lever.

There is, as may be perceived, a different kind of rest for the lever sliding on another standard, behind the standard *i*, carrying another slide rest, pierced with holes, to receive the end of the lever, by which the different positions desired may be obtained; *k*, is the lever, with one end placed in the swivel rest *j*, and has two tools required for performing the first part of the operation of making a soup plate fixed in it, as at *l*. The lever is furnished with a cross handle, to be worked with both the hands of the operator, one arm of the handle being longer than the other.

The shanks of these tools are wedge shaped, and being placed in opposite directions in a mortice or hole formed in the lever's centre over the work, a slight tap of a hammer will set them fast. There is also a small screw which keeps them firmly in their places.

When the dies, that is the hollow or concave, are used, the hold fasts keep the metal plates which are under operation sufficiently firm in their places; but when moulds are used, it is necessary to keep the plates down upon the mould by a strong pressure from above; this is effected by the screw *m*, passing through the head frame, and turned by the small wheel upon its upper end.

Fig. 6, shows the manner of applying the screw *m*, to keep the metal plates steady when moulds are used: *n*, is a mould, and is screwed on to the spindle in the same manner as the die before described. The metal plate in the course of manufacture is turned over the mould; *o*, is a block of wood placed upon it; and *p*, is a bar of wood or iron placed between the block and screw; and on turning the wheel round, the screw *m*, descends and produces a powerful pressure on the block *o*, thereby holding the plate firmly on the mould.

Fig. 7, represents the mode of finishing a plate, and the tools used for that purpose: *n*, is the mould, the upper part of which fits into the counter-sunk recess in the metal plate when taken from the die *g*, before described.

After describing several figures of the different tools used in the apparatus in the forming of a soup plate, which tools must of course vary according to the nature of the article to be manufactured, the Patentee proceeds to describe the process of working as follows :—

A tin plate, such as is usually called in the trade " IXX soft tin plate," about ten inches and a half square, is prepared by having the corners cut off; it is then laid over the top of the die *g*, the hold fasts, *h*, catch hold of the projecting edges, which are then screwed down tight upon them, so that the plate rises up a little convex; a little sweet oil is then put on the plate, and rubbed all over it with yellow soap; the tools are then put into the lever *k*, and its end placed into the slide rest *j*; the quick motion derived from the pulley is then communicated to the spindle *d*, and consequently to the die and plate. The workman then takes firm hold of the cross handle of the lever *k*, with both his hands; and, bearing down rather hard, commences pressing the tin plate into the hollow, which forms the rim, and then over the outer edge of the die, working from left to right, thereby fixing the tin plate on the die. He then commences with the tool at the edge, and, working from right to left, bears rather harder, and continues down at the rim until he arrives at the edge of the hollow or bowl of the plate; he then holds the tool in a perpendicular direction, with a rather light, but firm hand, strikes down from the rim half an inch into the bowl; the lever is then turned so as to bring the other tool into operation, by pressing it down in the centre of the tin plate, and working with a light hand from left to right.

These two successive operations are termed the second and third heats. The next should be a strong pressure, with a heart tool, much pointed, into the bowl, so as to lay the plate close on, and should go quite to the flat.

The next operation is called the burnishing heat, commencing with the foot tool in centre, working left to right, but with little pressure, polishing slower as you proceed; turning the lever, and with the heart tool, in the same manner go slowly from left to right out of the bowl upwards, and when out, turn the lever; and with the foot tool polish as much of the rim as it will apply itself to; and, finally, with the heart tool very much inclined, go slowly polishing, left to right, out of the rim.

This finishes the first part of the operation, called the raising.

Now change the tools in the lever bar *k*; and having removed the heart and foot stool, replace them with the rim forming tool, and the cutting tool, and place the lever in the swivel rest, and put on the slow motion.

First, use the rim forming tool, and bestride the rise *h*, of the die with it; and pressing hard down on the lever bar, bearing first right and then left, from the place to receive the wire, when the plate is turned over afterwards on the mould; turn next the spindle in a direction with the sun, and polish the tin plate in a contrary direction, with a soft linen rag dipped in lime, slackened by the air only, and sifted through a fine hair sieve, and, finally, polished with a piece of still finer linen rag; then turn the lever, and use the cutting tool, the cutting edge being outwards; bestride the rise *i*, in like manner, with this tool, and press down hard on the lever, and bear outwards till all the outer edges of the tin plate not required to form the work are cut off.

This will finish the operations on the die; and the tin soup plate thus formed, must now be taken out of the die. The die must be unscrewed from the spindle, and a mould, which may be of hard wood, the outside of which must exactly corrrespond with the inside of the soup plate, must be screwed on to the spindle in its place; a piece of fine linen should then be spread over the mould to preserve the polish of the inside of the soup plate; and the soup plate should be turned over upon the mould, as shown at fig. 7; the block *o*, should be placed upon it, and screwed down tight upon it by means of the bar, and screw *h*, as shown in fig. 6.

Continue the slow motion of the spindle, and with a crescent tool, turning up the outer edge of the soup plate enough to hold the wire; then cut the wire to the proper length, and lay it in the rim so raised, hammering down the rim upon it at the place where the ends of the wire join, and other parts, just to hold the wire from slipping out, and with the crescent tool turn the rim still more over, and at length down upon the wire with the flat side of the tool; and for this purpose it will be necessary to lower the swivel rest *j*, by means of the slide, until the lever bar is at right angles with the standard; after this use the rim-finishing tool, which will close the rim neatly and smoothly over the wire, and cut off the rough edge on the inside of the lap over metal. This completes the soup plates, which may then be removed from the mould a fit article for sale in the trade.

It is evident that a great variety of work may be performed from the foregoing instructions; but when any deep vessel is required to be made with the said apparatus, it is necessary, moreover, to employ the process shown at fig. 6, which is called drawing down. The mould here shown at v, it will be seen, is deeper than the mould for making the soup plate on; and in order to make this deeper plate or vessel, it is necessary when the metal plate is screwed down on the mould by the screws, acting on the bar *h*, and block *o*, to commence hammering down the metal plate in the manner here represented, in order to stretch it down to the bottom of the mould; this is done by holding a wedge formed of hard wood under the metal plate, and beating it down with what is called a drawing hammer. This operation is only to gain an additional depth for the vessel, which is then finished as before described.

The specification concludes with these words:—Now whereas an endless variety of tools may be used with, and an endless variety of work performed by this invention; and whereas I claim as the said invention the apparatus hereinbefore described, for shaping plates of metal, and manufacturing various articles therefrom, and the said invention being, to the best of my knowledge and belief, entirely new.

[*Inrolled in the Inrolment Office, June,* 1831.]

To Samuel Jones, *of the Strand, in the parish of St. Clement Danes, manufacturer, for his invention of a certain improvement or certain improvements in apparatus, or part or parts of apparatus, for producing instantaneous light.*—[Sealed 20th November, 1832.]

This invention applies to the mode or manner of making, manufacturing, or constructing of the matches to be used for producing instantaneous light, which said improved matches may be ignited, by dipping the prepared ends in sulphuric acid contained in a bottle, as in common use; or they may be ignited by friction, produced by drawing the prepared end of the match between the rough surfaces of a piece of sand, glass, or emery paper; or in contact with any rough surface or body, which will produce sufficient friction to cause the combustion.

The said matches are intended to burn with a blaze or flame, similar to such as are used to light candles; or to burn with a slow or mouldering fire, as fuzees, for the purpose of lighting cigars, pipes, &c.; and consist, first, in constructing, making, or forming the matches out of strips of cotton, linen, hemp, flax, tow, or other fibrous materials, previously wove into cloth or tape, or what is commonly called inkle; or from threads of linen flax, hemp, or tow, twisted or combined together; which strips of cloth, tape, or inkle, or combined threads, are to be covered or saturated with a coating of wax, resin, spermaceti, tallow, or any compound of them, which will burn with a blaze or flame, and answer the purpose intended.

The tapes, or strips of cloth, or combined threads, may be saturated or coated with the composition, by drawing them through a quantity of such inflammable material in a liquid state placed in a vessel; or it may be applied to the tapes, cloth, or combined threads, by hand with a brush, or in any other convenient manner. The tapes, or strips of cloth, or combined threads, being thus prepared with the inflammable material, are to be cut into suitable lengths required for the matches, and their ends primed or charged with a composition of chlorate of potash, compounded or mixed with antimony in combination with sulphur (commonly called or known by the name of sulphurate of antimony), or such other chemical compound as will ignite by friction, and answer the purpose; which said compound of chlorate of potash and sulphurate of antimony is to be mixed with a mucellage of gums, starch, flour or glue, to render it sufficiently tenacious, so as to adhere on to the ends of the strips of cloth, or tapes, or combined threads; which ends may or may not be previously prepared for the compound by dipping them in hot liquid sulphur, as may seem requisite. These matches are intended to be ignited by drawing the prepared end between the surface of sand paper, &c. as before stated.

Secondly, in making or manufacturing matches out of strips of paper, strips of cotton, or linen cloth, or tape, or inkle, or from threads of linen, hemp, flax, or tow, combined also from strips or pieces of wood, scale board, or shavings, all which said materials are to be saturated with a solution of nitrate or chlorate of potash, or any other chemical composition, which will cause them, when ignited, to burn with a slow or smouldering fire as fuzees. The materials either before or after being prepared with the solution of nitrate or chlorate of potash, are to be cut into proper lengths for the matches; and when prepared with the solution, the ends are to be charged or primed with the foregoing compound of chlorate of potash and sulphurate of antimony, or any other chemical compound or composition which will ignite by friction, as before stated; and which matches, when so ignited, will not continue to blaze, but burn with a slow or smouldering fire, as fuzees.

And, thirdly, in making or manufacturing of matches from strips of wood, scale board, or shavings; or strips of wood, scale board, or shavings covered with paper, such said materials are to be saturated with a solution of nitrate or chlorate of potash, or any other chemical composition which will cause them to burn with a slow or smouldering fire as fuzees; which saturation may be effected either before or after the materials are cut into strips of the convenient size for matches.

The ends of the matches are then primed or charged with a composition or compound of chlorate of potash, mixed with camphor, sulphur, inflammable gums, or resins, farinaceous powders, powder produced from fungi, woods, bark, or vegetable fibre; or with vegetable sugars, and prepared or compounded with mucellage as above described, and in such proportions as will be found most convenient, or with any such other chemical compound as will ignite when brought in contact with sulphuric acid.

Having now described the nature of my said invention, and in what manner the same is to be performed, I wish it to be understood that I do not mean or intend to claim as my invention, any of the within named chemical compounds or compositions; nor do I claim the use of cotton threads or yarns, in the making of my improved matches, except when woven into cloth, tape, or inkle; but I do hereby claim as my invention, first, the making or manufacturing of matches from strips of cloth, or tape, or inkle, formed or woven from threads, of cotton, linen, hemp, flax, tow, or other fibrous material; or from threads of linen, flax, hemp, or tow, twisted or combined together; which said materials are to be saturated or coated with the inflammable composition as before stated, to burn with a flame or blaze, and to be charged or primed so as to be ignited by friction. Secondly, in making or manufacturing matches from strips of paper, cotton, or linen cloth, tape, or inkle, wood, scale board, or shavings, or from threads of linen, hemp, flax, or tow, twisted or combined together, which materials are to be saturated with a solution of nitrate or chlorate of potash, or such other chemical composition as will cause them to burn with a slow or smouldering fire as fuzees, the end of the matches being also primed to ignite by friction; and thirdly, in making matches from strips of wood, scale board, or shavings, either in conjunction or not with paper, and saturated with a solution of nitrate or chlorate of potash, or such other chemical composition as will cause them to burn with a slow or smouldering fire, and to be ignited by the action of sulphuric acid upon the priming or charge placed upon the ends of the matches.—[*Inrolled in the Roll's Chapel Office May*, 1833.]

Specification drawn by the Patentee.

To JOHN SILVESTER, *of Great Russell Street, in the county of Middlesex, engineer, for his having invented certain improvements in apparatus for raising the temperature of air to warm and ventilate buildings.* —[Sealed 5th June, 1832.]

THE improvements proposed by the Patentee consist of two particulars:—first, a peculiar construction of fire grate; and, secondly, a mode of heating air by bringing a series of air tubes in contact with a vessel of boiling water.

The plans suggested are far from being clearly set out, and appear to require some graphic illustrations, which, however, are not appended to this specification. We shall therefore attempt to describe the improvements as far as we are able to understand them from the Patentee's rather verbose explanation.

The fire grate is to be formed by a series of bars placed in a horizontal position, level with the floor of the room; under these is to be a recess for an ash pit. The front ends of the fire bars are enlarged in breadth; and, when these are placed close together, they form a flat plate. They are made hollow, and the bars leading from them are open at their under parts, for the purpose of conducting air from the room into the ash pit, to supply the fire from below the grate. The back ends of the bars rest upon the edge of the ash pit, and they are laid loosely in notches, for the convenience of being lifted up occasionally to clear the ash pit of dust.

At the back of the stove there is to be a boiler, against which a series of air tubes are to be placed, which tubes are to be constructed in the manner described in a publication printed in 1819, entiled "*The Philosophy of Domestic Economy, as exemplified in warming, drying, and cooking, &c., in the Derby Infirmary.*" No further description of this apparatus is given, except that its effects will be that of heating the air tubes more equally by their contact with the boiler, than could be effected by any other means.

It is added that the front of the grate may be closed up so as to constitute it a hot air stove, and it may be fed with fuel by means of a hopper.—[*Inrolled in the Inrolment Office, August,* 1832.]

ORIGINAL COMMUNICATION.

Remarks on Friction; and the resistance of moving Bodies.

WHEN Mr. Grahame's experiments on the results of drawing boats on canals at high velocities were first made known between two and three years ago, they excited some surprise; for they seemed at first to overthrow the established doctrine, of the resistance to the motion of a boat increasing as the squares of the velocities. It was then however conjectured, that the reason of this apparent departure from the law of resistance, was simply, that the boat at high velocities *is partially lifted out of the water*, and becomes therefore a boat of *less sectional displacement.*[*]

Mr. M'Neill's late experiments prove this to be the fact; and the apparently wonderful effects of high velocities are now admitted not at all to disturb the received law as to the resistance.

The consideration of these experiments and their results, has led me to consider whether the same principle which operates to cause a boat to rise out of the water when drawn at a high velocity, does not extend much further. It seems to me that the natural result of very high velocities of a moving body, on any surface or in any medium, will be, that the body will be *partially lifted up* from its contact with the medium or surface which supports it, and so meet a less number of *resisting particles.*

It has been observed by several engineers (though no accurate experiments have been made), that the carriages drawn on a railway move actually with *less friction* at very high velocities (say 20 miles per hour) than at low or moderate ones, (say seven miles per hour.)[†]

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[*] See a paper on Mr. Fairbairn's book,—London Journal, Second Series.

[†] This observation is borne out by the calculations made of the *power exerted by the engines* of a locomotive carriage. These calculations were made on the assumption, that the friction of a carriage on a railway is *a constant quantity*; and by computing the number of turns of the wheels per minute (from the number of strokes of the engine, and also by the diameter of the wheels), and multiplying the motion of the piston of the engine by *the contant resistance* it had to overcome, the power exerted by the

Now this effect could not take place except by the rails being *relieved* of part of the load or pressure of the carriages; in other words, by the carriages being *partially lifted up* from *contact* with the rails. I do not mean, of course, that they *do not touch*, but they *touch less*; the rims of the wheels do not bite into the rails so much.

So on a common road, if a carriage be drawn very fast, it will be seen to skim along the surface of the ground. This effect is more sensible when the ground is soft, viz. when it approaches more the condition and properties of a fluid.

But all bodies that are not *perfectly hard*, approach more or less the condition of a fluid, in so far as this, that whatever body be laid upon them, will sink in (perceptibly or imperceptibly) to a certain amount, provided the weight of the body supported be sufficient to cause any friction.

Then, when the body supported (a carriage for instance) is put in motion, or drawn by external force, it must displace (viz. either actually crush, or else depress) those particles of matter of the supporting body that lie in front of it; and hence resistance to its motion.

Now the particles of fluids, whether of great or little density (and in this examination I treat materials apparently hard as fluids), require always, according to their density and adhesion, a certain time to yield to force, and

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engine was computed. It was found to be (by this mode of calculation) greatly beyond what the dimensions of the cylinders, and the consumption of steam, would correspond to. Hence it was inferred, that an erroneous *ground of calculation* must have been taken, in assuming the friction to *be constant*, and that it really must be *less* at very high velocities than at low ones—which conclusion, being supported by observation of facts, deserves weight.

to change their position. If we cause a body to move through them, at such a velocity, that the time of its increments of motion is not less than the time that the particles require to be disturbed, then *the depth to which the supported body sinks in, the supporting medium* does not change; and the resistance to the motion of the body is regulated by the number of particles of matter that it has to crush or depress.

But if we increase the velocity of the drawn body up to such a point, that the time of the increments of its motion is less than the time required by the particles of the resisting medium to yield force, then the moving body will be lifted up, and will not displace so great a number of particles of the resisting medium; hence, the friction or resistance to the motion of the body will be diminished.

I suppose, in fact, the wheels of a carriage, whether on a common road or on a railway, to be *immersed partly* in the material of the road or rails, as a boat is partly immersed in a canal—the difference of condition being in degree, and not in kind. And I suppose, that at high velocities, the wheels of a carriage are lifted up a certain amount, *so as to displace fewer particles* of the matter composing the road, as a boat is found to *be lifted up* at high velocities, and so to have a less sectional displacement than at low velocities. If this mode of considering the subject be correct, it will show the reason of the fact said to be observed, respecting the decrease of friction on railroads at very high velocities.

Your obedient servant,

T. S.

NEW PATENT LAWS.

ON THE CLAUSE OF

MR. GODSON'S BILL,

NOW BEFORE

PARLIAMENT,

To Explain and Amend the Laws respecting Letters Patent for Inventions.

For the purpose of explaining the motives which have induced an acquiescence with, or deviation from, any of the original clauses of the Bill as proposed by Mr. Godson, we have numbered them 1, 2, 3, 4, &c. in the order in which they stand in the Bill, and beg to claim the attention of the reader to the following remarks upon those clauses, taken seriatim :—

1. There are many inventions of trifling value, which it might be desirable that tradesmen should, at a small expense, be enabled to secure to themselves the entire interest in for a short period. To such subjects a monopoly for *seven years* would afford sufficient time for remuneration. But inventions which refer to more important matters, as machines connected with the manufactures of the country, require a monopoly of *fourteen years*, as the first outlay in producing and bringing them to perfection involves considerable expense and delay.

2. The propriety of granting Letters Patent to persons who have obtained inventions by purchase, or otherwise, from native working mechanics resident here, is questionable; and might, if not carefully guarded, lead to serious inconvenience in our manufactures. It is therefore recom-

mended that the source from which the invention originates should, on all applications for Patents, be stated upon *oath*, to prevent fraud.

3. This clause must be considered as part of the preceding, and is open to the same objection. Query—Does its adoption present any practical advantages?

4. The subjects for which Patents may be granted, constituting the basis on which the law is to be founded, ought to be set out in the most definite and unequivocal terms, to avoid legal quibbling.

5. This protecting clause is very desirable, and would prevent the Patent for a useful invention being annulled, from incorporating some matters in the Specification which may have been partially known at some former period, but have gone out of use. This clause, however, does not stand in the Bill in its proper place.

6. If there are any instances in which it is not practicable to explain fully the principles and details of an invention by drawings, and written descriptions, then let this clause stand; but it appears difficult to imagine such a case; and it is certain, that such models, however accurately made, and carefully kept, could not remain for any length of time in working order, therefore it would be incapable of exhibiting the minor details of a complicated machine. It should, however, be left to the option of the Patentee to deposit such models, or not, as he may see fit, within a limited time from the date of the Patent, merely as auxiliaries to the inrolled Specification and Drawings.

7. This clause permitting a defective Specification to be amended, affords a very necessary relief to the Patentee, who, from want of experience, or from accident, may have omitted certain parts, or failed in rendering some of the details of his invention so clear and evident in his Specifi-

cation, as to enable an ordinary workman to construct and use the same; but such amended Specification must afford no retrospective protection to such particular parts, that is, must not be available in a Court of Law against any party who may have employed such parts of the invention prior to the depositing of the amended Specification.

It also appears desirable, that as improvements arise upon an original invention, the Patentee should be allowed to secure those improvements without incurring the great expense of several Patents for mere variations and modifications which have grown out of, and been essential to, the perfection of the original project; this clause therefore provides a salutary remedy against an evil which has been long felt as operating both to the injury of the Patentee, by not protecting his ingenuity,—and of the public, by not specifying the invention in its perfect state. But if some provision is not made for examining these amended Specifications by competent and disinterested persons, legally authorized, Patentees will seldom confine their improvements to the principles or features of the original invention, and we shall find engrafted upon an existing Patent every variation of construction, and adaptation of mechanism, which the language of a vague and sweeping title may be supposed to embrace. It is therefore absolutely necessary, that the subjects of such amended Specifications should be admitted to be legitimate improvements upon the original inventions, before they are allowed to be protected by, and form part of, the existing Patent right.

8. The proposed stamp duty upon supplementary Specifications appears to be a very unnecessary imposition. The best mode will be for the Patentee to present his petition, as in soliciting a new Patent, which, with his Specification, should be referred to the Attorney or Solicitor-General and their Consultive Board, and when approved and certified,

on payment of the usual fees attendant thereon, to be inrolled, and form part of the original Patent.

9. The practice of the Law Courts has hitherto been, in the event of a Specification describing any part of a machine, apparatus, or process as new, which had been known and used before, that the fact of such *previous existence* of such *part* of the invention, proved the affidavit of novelty originally made by the Patentee to have been untrue; the Letters Patent, therefore, under these circumstances, were considered to have become "*null and void.*" The forfeiture of the whole Patent right, which is the penalty attendant upon such a trivial point introduced into the Specification, perhaps through ignorance or accident, is therefore sought to be avoided, for which purpose a clause to this effect is every way desirable, in order that if the Patentee, from want of information, claims more thanis really new, that error shall not vitiate the whole grant; but it does not appear necessary to inroll another Specification omitting the old parts, as on proving the fact, they naturally assume the position of other parts of the contrivance, which have been employed as public and common property.

10. It is very questionable whether the assertion with which this clause opens is really founded in fact, or at least fairly argued. If the learned proposer of the Bill alludes to a circumstance which he mentioned when introducing the Bill to the House, that a Patent taken for an improved process of *pressing* woollen cloth, was void, owing to the mistake of one letter in the title—P instead of D—(*dressing* woollen cloth), we should say that a Patentee ought to be more circumspect in making his affidavit. Reference might also be made to a Patent for "an improvement in the *formation* of bolts and nails for ships," which turned out to be an improvement only in the

"*form*" of bolts, &c.; and also to an improved *projectile*, which proved to be a *projector* (a gun). If by accident these errors should in future occur, accompanying the Petition and Affidavit with a preparatory Specification, a sketch or slight description of the invention, that would at once point out to a Consultative Board the object the Patentee has in view; and also prevent the possibility of another accident, which has occasionally occured, viz. that of forgetting the precise features of the invention originally sworn to, and of inventing or picking up a something else, to form a subject for the Specification.

11. Whatever may be urged against the unnecessary parade and retinue of office through which the petition for Letters Patent has to travel, from the affidavit of the petitioner before a Master in Chancery, to the accomplishment of the Grant under the Great Seal, the Patentee is not personally engaged in that drudgery, it devolves upon his legal adviser; therefore, to avoid the opposition which will be inevitably raised against interfering with what may be claimed as vested rights, a Patentee may rest contented with a reasonable reduction in the charges for stamps and fees, without regarding the state machinery employed to usher a Patent into the world: provided he obtains a priority of right from the time of depositing his petition. But under no circumstances should a Patent be granted to a petitioner without his solemn asseveration, that the matters contained in the petition are true.

12. The preparatory Specification which is intended to describe the general features of the construction, and object of the invention, is proposed to be delivered with the petition, in order that the subject may be identified and defined, which will prevent the possibility of introducing into the ultimate Specification, an invention which was not contemplated at the time of making the affidavit.

13. The preparatory Specification, sealed up, is to be delivered to the Attorney-General or Solicitor-General, with the petition, for him to report to his Majesty as to the propriety of granting the Patent; and if any caveat is opposed to the grant, the subject of the petitioner's invention will be seen by opening the sealed packet; but it must remain closed until this period, to prevent the invention becoming exposed.

The law officers are to make their report upon the petition as heretofore; and the clause provides that the Bill for a Patent shall be forthwith prepared, without the King's Warrant, and be passed immediately to the Great Seal, without the intervention of the several offices of the Signet, the Privy Seal, and the Hanaper. However desirable it might be to dispense with these useless offices, the claims of interested persons would be opposed to the enactment; and, therefore, insisting upon these minor points might endanger the more important features of the Bill, and cause it to be rejected altogether.

14. The construction of this clause goes to the abolition of the offices last alluded to, which, for the reasons given, it would be injudicious to insist upon; and as to the period from which the Patent is to take date, that is of very little consequence, provided that protection is afforded to the invention from the time of depositing the petition for a Patent.

15. It cannot be denied that abuses have occurred under the existing practice of entering caveats, principally from the vague and general terms in which the subjects have been described in the title of the caveat; this, however, might be in future prevented, by requiring that a Specification of the general features of the invention desired to be protected should be sealed up and delivered with the caveat, as the subject of the invention claimed. Under such an

arrangement it would be impossible, by a sweeping general title, to embrace every invention applicable to a similar object, or to oppose a plan subsequently obtained by fraudulent means against the just claims of the real inventor. There is therefore no just grounds for debarring an inventor of the protection which may be afforded to him under a floating caveat to be in force as at present for a year, for a specific invention properly identified.

What could be the motive for inviting all the world, by an advertisement in the Gazette, to inquire into the secrets of every petitioner for a Patent, it is difficult to conceive; and to allow oppositions to be entered against a Patent after the secret may have been discovered, is giving countenance to, if not inducing a system of plunder, which might be the ruin of many unsuspecting inventors, and certainly would be the dread of all.

16. When claims to inventions connected with science and manufactures, involving considerable intricacy, are opposed to each other, it is impossible that the law officers of the crown can find leisure to investigate, or possess practical knowledge sufficient to determine with certainty such abstruse questions; it would therefore be greatly for the interests of inventors, if some competent tribunal were appointed under the authority of the Attorney and Solicitor-General, before whom these matters of science could be brought, whose duty should be to advise upon the scientific points only, leaving to the Attorney or Solicitor-General the power of determining to grant or refuse the Patent, as under the present practice. It would also be extremely desirable if by such a competent Board Specifications could be examined, approved, and certified as sufficient.

17. In legislating upon the course to be pursued in granting Patents for inventions, one important feature of which is to reduce the expense, it would be highly

improper to leave the costs of hearings open to the arbitrary dictum of any law officer; therefore the fees to be paid must be defined.

18. The costs of obtaining Letters Patent are certainly exorbitant, and operate as a severe tax upon inventive genius; a reduction therefore of the fees and stamps attendant upon these grants is very desirable.

19. It is a matter of no consequence, in what way, or to whom, the several fees of the offices are paid; perhaps as long as the offices exist it is most convenient for the Solicitor, or the agent, to pay the several fees at the respective offices, as he receives the document.

20. The costs of Letters Patent for England, Scotland, and Ireland, amount to about £350, owing to the Patent being a distinct grant in each of the three kingdoms, by which a multitude of offices are brought into requisition, and very extravagant fees and stamps charged; it appears therefore extremely desirable, that after the grant of Letters Patent has been obtained in one kingdom, that grant should be extended to the other kingdoms by a simple and less expensive process. An approbatory Report and Bill from the Lord Advocate in Scotland, and the Attorney General in Ireland, would be quite sufficient to warrant the appending of the seal in each country, which might be done at a small charge.

21. An original Patent solicited in Scotland or Ireland, ought to be subject to the same process and costs as in England; but the relief should be afforded as in the last clause, on the extension of the grant to the other two kingdoms.

22. The subject of this is expressed in the previous clause, and is effected by enacting, that the law should, in all its provisions, extend to Scotland and Ireland.

23. The assignment of shares in a Patent right to an indefinite number of persons, has been considered by the legislature objectionable, from a presumption that joint stock companies might by that means be formed under a Patent right, which the crown has no power to do; licences, however, from the Patentee to use his invention are not restricted, and therefore such a clause appears to be unnecessary.

24. It frequently happens that from the difficulty of introducing a new invention, and from the inability of the Patentee immediately to perfect his design, that an invention has scarcely been brought into general use before the expiration of the Patent right; it is therefore just, as a remuneration for the ingenuity, labour, and expense exercised in bringing a useful invention before the public, that the Patentee should, under such circumstances, have an extension of his original grant, without the labour and expense of obtaining that privilege through an Act of Parliament. Therefore, upon the Patentee presenting to his Majesty a petition and affidavit of the facts, the Attorney or Solicitor-General should be empowered to examine and report upon the propriety of the extension; and if a satisfactory case is made, to advise that further Letters Patent be granted to the said inventor for such term of years as may appear proper; but that the public, who may be preparing to use the invention at the expiration of the term, should not be inconvenienced, the application for extending the right should be made at least a year before the expiration of the Patent; and when obtained, the grant and the term of its extension should be published as a new Patent.

25. It might be very desirable, in the event of an action pending for the infringement of a patented invention, if the judges of a common law court could have the power to

suspend the exercise of such invention, in the way of an injunction; and also to order that the plaintiff be permitted to inspect such assumed piracy.

26. Much unnecessary trouble and expense might be avoided in case of trial upon an assumed infringement, if both parties were called upon previously to state the points upon which they intend to urge their objections and defences in the cause; this would prevent the necessity of preparing a multitude of documentary evidence and witnesses which might be brought to bear upon the case, but which have no necessary connexion with the merits at issue.

27. Accommodating the convenience of witnesses, might be a proper reason for changing the venue in an action on Patent right, which would very considerably reduce the attendant expenses.

28. The acknowledged incapability of judges, juries, and counsel, to understand the bearings of many important points arising in the discussion of questions of practical science, renders it desirable that the jury should be composed (partly at least) of men whose habits have led them to the frequent consideration of scientific subjects; and it might greatly assist in rendering the questions at issue perfectly understood, if the machines, models, and drawings were open to the inspection of the jury previous to the trial.

29. The great expense of preparing evidence in suits for piracy on Patent rights, which is not allowed on legally taxing the costs, renders the issue of a suit, even when the plaintiff obtains a verdict, exceedingly burthensome; it is therefore to cover some of these outlays, that treble the amount of damages found by the jury are proposed to be awarded to the plaintiff as a remuneration; but that would frequently amount to no more than the sum of three shillings: it should be double taxed costs, as in piracies on copyright.

30. It would be perfectly right that the costs of all necessary witnesses should be paid by him against whom the verdict is recorded ; but if this clause were enacted, the certainty of recovering the full amount of outlay would be likely to induce a confident solicitor to retain all the scientific individuals within his reach, whose evidence might be likely to affect the cause, and thereby not only deprive his opponent of the fair means of defence, but entail upon him a most unnecessary and outrageous expense. And as to the costs of making experiments to support a plea, so extensive a range of collateral investigations might be uselessly brought into the question, as to cause, by the heavy expense attendant, the absolute ruin of the unfortunate defendant.

31. Though a verdict may have been adjudged against a Patentee, which shall virtually have annulled his Patent right, yet he may continue harassing the public with suits upon his assumed right, until by the tedious and costly process of writ of *scire facias*, the grant is cancelled. The object of this clause therefore is,—on sufficient evidence being produced that the grant was improper, and the Patent bad, to empower the Judge to issue a precept authorizing the Lord Chancellor to cancel the Letters Patent forthwith.

32. It appears that under this clause a fictious action might be instituted, for the purpose of establishing the validity of a defective Patent, which after trial, and a verdict obtained, could not be again questioned by any other party, however satisfactory their defence might be ; and that the fact of similarity need only be proved to establish that of piracy : this could not be endured.

33. It would be desirable, whenever the Act comes into operation, that its provisions should apply retrospectively to all Patents which are at present existing.

34. The Act in all its provisions should extend in like manner to Scotland and Ireland, and a Specification of every invention so patented should be inrolled in London, Edinburgh, and Dublin.

We have much satisfaction in stating that the Resolutions above proposed in London, have been received by the Committee of the House of Commons, together with those from different parts of the country; and that in the points which are of primary importance, and in which all parties appear to agree, the Honourable Members of the Committee have signified their acquiescence.

From these remarks upon Mr. Godson's Bill, it will be seen that various alterations were expedient, and that some were absolutely indispensable before the Bill could be formed into an Act, which would meet the necessities of the case, and afford that protection and relief to Patentees for which the Law is designed. Such alterations and amendments have been embodied in the Bills proposed by the Birmingham and Leeds Committee, and if adopted in their general spirit, will be found satisfactory and sufficient.

In furtherance of the object of obtaining an effective Code of Laws for the protection of new Inventions, a highly respectable and numerous meeting of Patentees and other scientific gentlemen has been called in London since the publication of our last Number; and the resolutions adopted at that meeting are as follow :—

"*At a Public Meeting*, convened by advertisement, of persons interested in the proceedings now pending in Parliament regarding the revision of the Law of Patents for Inventions, held on Thursday, the 9th day of May, 1833, at the *Museum of National Manufactures, and of the Mechanical Arts*, 28, Leicester Square:

" Dr. Birkbeck having been called to the Chair, the following Resolutions were passed unanimously:—

Proposed by Mr. Babbage, and seconded by Mr. Rosser—

" I. That it is the opinion of this Meeting, that the great supply throughout the civilized world of the necessaries, comforts, and luxuries of life, is the result of the creative powers of science and the arts; so that with their growth or decline, nations have risen or fallen; and that the unprecedented wealth, power, and resources of this kingdom, and all which they have achieved, have principally resulted from the unrivalled skill, energy, and enterprise of the productive classes, in the contrivance, use, and employment of mechanical and chemical means and products.

Proposed by Dr. Lardner, and seconded by Mr. Toplis—

" II. That it appears to this Meeting, that in order to call forth to the fullest extent, the inventive genius of this country, it is for the common interest of all classes, that the profits arising from improvements in the arts, and manufactures, should be secured to their authors for certain limited periods.

Proposed by Mr. Lowe, and seconded by Mr. Hawkins—

" III. That the present state of the Law of Patents is objectionable, on account of the heavy expense which it causes, and is ineffectual from its extreme uncertainty; and that it is alike injurious both to the inventors and to the public.

Proposed by Mr. Newton, and seconded by Dr. Lardner—

" IV. That the revision of the Law regarding Patents for Inventions being now before the Legislature for consideration, it is expedient that a Committee be appointed to take such measures as they may judge proper for procuring such alterations in the Bill, now in progress through the House of Commons, as may render the Law more just and effectual."

In conformity with the last resolution, a Committee was then nominated, which have held its Meetings at the Museum, 28, Leicester Square, from day to day, and the following is the series of clauses recommended to the House of Commons, as the basis of an Act, in place of Mr. Godson's Bill:—

"At several Meetings of the Committee, appointed at the Public Meeting, convened by Advertisement, and held at the *Museum of National Manufactures and of the Mechanical Arts*, Leicester Square, on Thursday, 9th May, 1833, to take into consideration Measures regarding a Revision of the Patent Laws, which have been held at the Committee Room at the Museum, on Friday, 10th May, 1833, and subsequent days, the following Resolutions have been agreed upon; and they are directed, by a vote of the Committe, to be in the most respectful manner submitted to the consideration of the individual Members of the Select Committee, to which is referred, by the Honourable the House of Commons, the Bill for Explaining and Amending the Law of Patents for Inventions, introduced by Mr. Godson:—

"1. That, from the growing importance of the manufacturing industry of this country, it becomes of essential consequence for the encouragement of inventive talent, and for the extension of public benefit thence accruing, that the rights of Inventors, and their correspondent obligations with the community, should be clearly defined and securely protected by some positive enactment of statute law.

"2. That it shall be lawful to grant Letters Patent for any newly contrived machine, engine, apparatus, tool, or implement; and for any improvements, in existing machines, engines, apparatus, tools, or implements; and for any new or improved combination, arrangement, or adaptation of material things, whether mechanical or chemical, which shall produce a useful result; and for any new and improved manufacture, process, or mode of operation designed for the purpose of accomplishing a beneficial object; provided that the same shall not be publicly known or in use in these kingdoms.

" 3. That it is desirable that Patents should be granted to any one who introduces a useful invention or improvement, whether his own, or shown to be fairly obtained from another, be he resident in this country or not.

"4. That it should be lawful for Patentees, or their representatives, to sell or assign, or allow to be used under license, the privileges vesting in them by their Letters Patent to any number of individuals.

" 5. That it is desirable that Letters Patent should be granted for the terms of seven years and fourteen years in cases generally, and for the term of twenty-one years for Inventions which in their nature require extraordinary outlay and time for their introduction; and that in each case the term, before its expiration, may lawfully be extended, on sufficient ground shown.

" 6. That it is expedient to provide the means of extending Letters Patent under peculiar circumstances, without the expense and trouble of an Act of Parliament.

" 7. That it is advisable that the term of the Patent shall commence from the day on which the Patent is sealed.

" 8. That an applicant for a Patent should present a Petition to have the same granted, accompanied with an affidavit declaratory of his lawful possession of a new Invention or Discovery, and a sealed Specification, accompanied by drawings or models, if necessary, of the general principles and features of the same.

"9. That it should be lawful, as heretofore, to enter Caveats to protect an Invention; but that a description of the general features of the Invention should be lodged therewith under seal.

"10. That it is immediately necessary, as Patent Rights are sought for for the purposes of business, by men of business, that the process of suing for those rights should be so simplified as to be divested of all official intricacy, and be freed from all unnecessary forms which serve to procrastinate the proceedings, so that every applicant may be promptly assured of the issue of his application, and of the time at which his grant may be attained.

"11. That it is desirable that the subjects of Petitioners and Caveats, when opposition arises, be referred to a Scientific Board.

"12. That it is expedient that Officers and Clerks in the several departments connected with the procuration and registry of Patents for Inventions, should be precluded from interfering directly or indirectly in any way as agents for individuals suing for Patents.

"13. That a full and complete Specification, illustrated by drawings and models, if necessary, of the Invention or Discovery, should be deposited in a public Office of Records, within six calendar months from the date of sealing the Patent, under the hand and seal of the Patentee, or of his lawful representative by power of attorney; or, in case of death, of his executors or administrators, to be attested by two credible witnesses, and not by a Master in Chancery as heretofore.

"14. That it is important that some competent board or tribunal (say of three members) be appointed to examine every Specification, and to call for further elucidation, if necessary, and to certify that the Specification is sufficient and satisfactory; and, after their certificate, the specification as to its sufficiency shall not be questioned in any court of law. The Specification, after examination and certification, should be registered in the office, within one month from the time of its deposit, and there be left for public inspection.

"15. That it is necessary that a Patentee be allowed to correct and amend his Specification and to add improvements, which shall become part of the original Patent Right, and be published as an addition to the grant.

"16. That Specifications of Patents for Inventions being sufficiently distinct from those matters which furnish the ordinary materials for record in Courts of Equity, to warrant their being kept apart from the miscellaneous records of those courts, and to be deposited in an office expressly appropriated to Patent Records, it is important to establish this regulation with the view of rendering the Inventions to be secured to the community after the expiration of the monopoly, more readily accessible to the public, and the ordinary business of consulting Specifications less operose, less expensive, and less uncertain than it now is.

"17. That it is immediately necessary, and will be conducive to the general welfare of the community, that Letters Patent should be granted at a much less cost than the present.

"18. That it is very desirable that a Patent Right granted in England may, at the desire of the Petitioner, be extended to Scotland, Ireland, the Colonies and Islands abroad, and that the sign manual of His Majesty shall not be necessary to warrant the proper Officer to fix the the proper seal to such extended Letters Patent upon the report of the Lord Advocate for Scotland, or Attorney-General for Ireland. And if the Invention or Discovery be not new in one part of the Empire, that defect shall not vitiate the grant for the other part of the Empire.

"19. That it is desirable that the title of every new Patent, the name, &c. Patentee, the term of the Patent, and the date from which the Patent begins to run, be inserted in the Gazette, on some day in the calendar month next succeeding that in which the Patent is sealed.

"20. That the title of every expired Patent, the name of the Patentee, and the date of its expiration shall be inserted in the Gazette on some day in the calendar month next succeeding that in which the said Patent shall have expired.

"21. That it appears to be important, and likely to be beneficial to the public, that an official vendible publication of Patent specifications should be provided for, with such safeguards for the authenticity of the published copy as to make it admissible as documentary evidence in Patent Causes, with the view of lessening the present charges for office copies of specifications, and to disseminate more freely the knowledge of Patent Inventions.

"22. That it is immediately necessary to enact, that if the Patent and specification be bad in law as to part thereof, whether from partial want of novelty, or any other cause, they shall not be bad in law as to the remainder thereof respectively.

"23. That it is important that the protection of an invention shall be given from the period of depositing the Petition, if ultimately granted.

"24. That it is immediately necessary to enact that Letters Patent should not become void although the subject for which the Letters Patent may have been granted shall have been used in any particular part of the United Kingdom of Great Britain and Ireland, either in private or in an imperfect manner, or has not been practically used in a public manner within ten years prior to the date of the Patent; and that if any person has used the same, or a similar invention in private, he may continue to use it in the same way, and to the same extent, but not otherwise.

"25. That the publication of an Invention from knowledge of it surreptitiously obtained, shall not vitiate a Patent subsequently taken out for the same object by the original Inventor, or legal Possessor of the Invention.

"26. That it is expedient that the exclusive privileges of a Patentee, in either great division of the Empire, ought not to remain in force, unless the Patentee affords to the public in such part of the kingdom, proper facility for deriving the advantages of the Invention.

"27. That great evils are very generally admitted to arise from the trial of causes involving the consideration of scientific questions before juries taken from classes of society not commonly prepared for the full comprehension of such questions; and therefore it is deemed highly necessary to provide, in some way, for the trial of Patent Causes before a competent jury.

"28. That it be recommended as expedient to be enacted, that the Plaintiff in an action brought in support of, or under a Patent, be bound to state to the Defendant before plea, the particulars of the cause of action, and that the Defendant may plead the general issue, with which he shall be bound to deliver a notice of all the objections and defects upon which he intends to reply, at the trial of that issue.

"BY ORDER OF THE COMMITTEE,

"CHARLES TOPLIS,

"HONORARY SECRETARY.

" *Museum of National Manufactures, &c.*
Leicester Square, May 16th, 1833."

List of Patents

Granted by the French Government.

(CONTINUED FROM PAGE 260.)

To De Reaurepaire, Anne Victorhypeolyte, of Paris, for an improved inkstand.

— Chandilet, Antoine Victor, of Paris, for a new kind of button for military or civil dress.

— Walker, John, for an improved stock for gentlemen's cravats.

— Chomeau, Leonard, for a new kind of chocolate made with Spanish chesnuts.

—Pierre of Raynaud, Lyons, for a new method of cutting systematically every kind of dress.

—Palmer, Guilluema, for a cart which excavates the earth and loads itself.

PATENTS FOR IMPROVEMENTS AND ADDITIONS MADE BY THE PATENTEES THEMSELVES ON PATENTS ALREADY GRANTED.

— Mr. Breuzin, Sulpice Christophe, lampmaker, represented by Mr. Perpigna, of the French and Foreign Office for Patents, Rue-Neuve, St. Augustine, No. 28, for a lamp on the Œolipile system with a vertical flame.

— Galy Cazalat, of Versaille, for additions to his patent for improvements on steam engines.

— Brunier, Louis, for inprovements on his hydraulic machine.

— Lecoq, Octare Amedee Louis, of Paris, for improvements on his eccentric double action pumps.

— Malebouche, Jean Thomas Eugene, for improvements on his new system of lighting with oil.

— Goin, Quentin Francois, for improvements on his patent for an improved bobbin net frame on the circular bolt system.

To Cresson, d'Orval, of Paris, for improvements on his mechanical apparatas for manufacturing surgical instruments with caoutchouch.

— Ormund, Jean Antoine, of St. Etienne, for a new manner of combining the patterns on the Jacquart frame.

— Derpruneaux, Gabriel, for improvements on his method of conducting fluids.

— Robin, Pierre Barnard, for improvements on his new locks, with eccentric cylinders.

— Bert, Nicola Francois, of Paris, for improvements on his portable vapour baths.

— Madden, John Byrne, first improvement on his dragging and excavating machine.

— Manden, John Byrne, second improvement on the same machine.

— Vacheron, Louis Francoise, of St. Guen, near Paris, for additions to his improvements of Malder's method of employing caoutchouc in the elastic part of suspenders, garters, &c.

— Jaillet, Junior, of Lyons, for sixth improvement on his new frame for making ornamented tissues.

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New Patents

SEALED IN ENGLAND.

1833.

To James Noble, of Little Horton, in the parish of Bradford, in the West Riding of the county of York, worsted-spinner, for his invention of a machine for combing wool and other fibrous materials.—Sealed 25th April—6 months for inrolment.

To Archibald Douglass, of Manchester, in the county of Lancaster, manufacturer, for his invention of certain improvements on power-looms, and the shuttles used therein.—Sealed 30th April—6 months for inrolment.

To Charles Collins, of 22, Bridge Road, Lambeth, in the county of Surrey, engineer, for his invention of an improvement or improvements in the making or manufacture of axle trees.—Sealed 2nd May—6 months for inrolment.

To Christopher Robinson, of Athlone, in the county of Roscommon, Ireland, for his invention of certain new or improved machinery for transferring caloric from aeriform or fluid bodies, to other bodies of the like description, and applicable to other useful purposes—Sealed 2nd May—6 months for inrolment.

To John Holmes, of Birmingham, in the county of Warwick, engineer, for his invention of an improvement in metallic shanks for buttons.—Sealed 4th May—2 calendar months for inrolment.

To Henry Jones, and Thomas Jones, both of Marple, in the county of Chester, weavers, for their invention of a certain method of expanding or stretching cloth, and keeping it even during the process of weaving, and of preserving the selvages thereof.—Sealed 4th May—2 months for inrolment.

To Robert Stein, of Edinburgh, Esq., for an improved steam engine on the rotary principle.—Sealed 7th May—6 months for inrolment.

To William Norvell, of the town and county of Newcasle-upon-Tyne, engineer, for an improvement of the machinery now in use for making strands from the yarns, and laying ropes by such machinery at one and the same time.—Sealed 8th May—2 months for inrolment.

To James Fraser, of Bevis Marks, Saint Mary Axe, in the city of London, engineer, for certain improvements in steam boilers, and in the arrangement of the machinery attached thereto, as applicable to land carriages.—Sealed 8th May—2 months for inrolment.

To Thomas Spinney, of Cheltenham, in the county of Gloucester, gass engineer, for a new combination of materials for the manufacture of crucibles, melting pots, and fire bricks.—Sealed 11th May—6 months for inrolment.

To Louis Paul Lefort, late of Grand Couroune, near Rouen Figuce, but now residing in Cornhill, in the city of London, merchant, for an invention communicated to him by a certain foreigner, for certain improvements in machinery or apparatus for making or manufacturing lace, commonly called bobbin net.—Sealed 17th May—6 months for inrolment.

To William Graham, junior, of the city of Glasgow, cotton spinner, and power loom manufacturer, for an invention communicated to him by a foreigner, for a self-acting temple, to be used in the operation of weaving by power or hand loom.—Sealed 22nd May—6 months for inrolment.

CELESTIAL PHENOMENA, FOR JUNE, 1833.

D.	H.	M.	
1	0	0	Clock after the Sun 2 m. 34 s.
—			Sun rises 3 h. 51 m. sets 8 h. 5.
—			Moon rises 6 h. 59 m. p.m. sets 3 h. 33 m. A. M.
—			Moon passes the meridian 11h. 36 m.
1	23	52	Ecliptic opposition or ○ full moon.
2	0	0	Mer. R. A. 3 h. 31 m. dec. 17. 25. N.
—			Ven. R. A. 3 h. 5 m. dec. 16. 31. N.
—			Mars R. A. 8 h. 18 m. dec. 21. 7. N.
—			Jup. R. A. 1 h. 37 m. dec. 8. 55. N.
—			Sat. R. A. 11 h. 32 m. dec. 5. 34. N.
—			Georg. R. A. 21 h. 41 m. dec. 14. 41. S.
—			Vesta R. A. 19 h 27. m. dec. 19. 50. S.
—			Juno R. A. 14 h. 53 m. dec. 0. 28 S.
—			Pallas R. A. 3 h. 48 m. dec. 1. 31. S.
—			Ceres R. A. 5 h. 21 m. dec 23. 40. N.
5	0	0	Clock after the ☉ 1 m. 6 s.
—			☉ rises 3 h. 48 m. sets 8 h. 9 m.
—			☽ rises 10 h. 57 m. A. M. sets 6 h. 10 m. A. M.
—			☽ passes mer. 15 h. 2 m.
7	0	0	☿ Stationary.
0	5	0	♂ in Aphelio.
8	6	0	☽ in Apogee.
6	0	0	half Axes } 40. 77. Jupiter's ring } 0. 1.
10	21	0	☿ North Node.
10	0	0	Clock after the Sun 1 m.
—			☉ rises 3 h. 45 m. sets 8 h. 31 m.
—			☽ rises 0 h. 50 m. A. M. sets 11 h. 24 m. A. M.
—			☽ passes the mer. 18 h. 46 m.
10	0	21	☽ in □ or last quarter.
12	0	0	Sun and Jupiter quartile
13	3	46	☽ in conj. with ♃ long. 26. in Aires. ☽ lat. 5. 7. S. ♃ lat. 1. 10. S. diff. of lat. 3. 57.
14	18	10	☽ in conj. with ♀ long. 8. Taurus. ☽ lat. 4. 26. S. ♀ lat. 2. 44. N. diff. of lat. 1. 42.
15	0	0	in Perihelio.
15	0	0	☉ rises 3 h. 44 m. sets 8 h. 16 m.
—			☉ Before the Cloch 1 m.
—			☽ rises 2 h. 28 m. A. M. sets 5 h. 17 m. P. M.
—			☽ passes the meridian 22 h. 37 m.
17	7	0	☽ in conj. with ☿
17	11	10	Ecliptic conj. or ● new moon.
17	11	24	☽ in conj. with ☿ long. 26. in Taurus. ☽ lat. 1. 39. S. ☿ lat. 3. 2. S. diff. of lat. 1. 23.
18	0	0	Mer. R. A. 5 h. 50 m. dec. 24. 36. N.
—			Venus R. A. 3 h. 14 m. dec. 14. 44. N.
—			Mars R. A. 8 h. 58 m. dec. 16. 35. N.
—			Jupiter R. A. 1 h. 49 m. dec. 9. 59. N.
—			Saturn R. A. 11 h. 33 m. dec. 5. 20. N.
—			Georg. R. A. 21 h. 40 m. dec. 14. 46. S.
—			Vesta R. A. 19 h. 19 m. dec. 21. 7. S.
—			Juno R. A. 14 h. 45 m. dec. 0. 23. S.
—			Pallas R. A. 4 h. 20 m. dec 1. 14. S.
—			Ceres R. A. 5 h. 50 m. dec. 24. 27. N.
20	0	0	☽ in Perigee.
—			☉ before the Clock 1 m. 6 s.
—			☉ rises 3 h. 44 m. sets 8 h. 18 m.
—			☽ rises 4 h. 14 m. A. M. sets 6 h. 58. m. P. M.
—			☽ passes the meridian 0h. 38m.
20	16	34	☽ in conj. with ♂ long. 11. in Leo. ☽ lat. 2. 30. N. ♂ lat. 1. 18. diff. of lat. 1. 12.
21	5	16	☉ enters Cancer.
23	9	13	☽ in conj. with Jupiter long. 24. Virgo ☽ lat. 4. 38. N. Jupiter lat. 2. 15. diff. of lat. 2. 23.
24	3	28	☽ in □ or first quarter.
25	0	0	Before the Clock 2 m. 11 sec.
—			☉ rises 3h. 46 m. sets 8h. 19 m.
—			☽ rises 0 h. 58 m. P. M. sets 0 h. 31 m. A. M.
—			☽ passes mer. 7 h. 0 m.
25	13	36	Jupiter's second sat. will im.
0	14	3	Jupiter's first sat. will im.

J. LEWTHWAITE, Rotherhithe.

METEOROLOGICAL JOURNAL,

FOR MAY AND JUNE 1833.

1833.	Thermo.		Barometer.		Rain in inches	1833.	Thermo.		Barometer.		Rain in inches.
	Hig.	Low	Hig.	Low.			Hig.	Low	Hig.	Low.	
April.						April.					
26	56	40	30,11	30,06		11	72	42	30,07	30,00	
27	62	40	30,04	29,90		12	77	43	30,10	30,08	
28	57	44	29,72	29,66	,075	13	71	41	30,06	30,01	
29	52	34	29,62	29,53		14	72	44	30,13	30,09	
30	53	30	29,57	29,56	,1	15	81	48	30,01	29,94	
May.											
1	53	37	29,63	29,58	,05	16	79	48	29,92	29,86	
2	57	43	29,71	29,60	,125	17	80	51	30,01	29,94	
3	67	38	29,80	29,76		18	73	47	30,17	30,07	575
4	77	40	29,98	29,84		19	61	41	30,19	30,06	
5	71	48	30,29	30,16		20	73	40	29,69	29,83	
6	69	41	30,46	30,39		21	75	43	30,12	30,04	
7	68	40	30,35	30,23		22	74	43	30,31	Staty.	
8	69	41	30,06	29,90		23	76	45	30,31	30,28	
9	71	41	29,81	29,74		24	79	49	30,31	30,15	
10	68	44	29,95	29,84		25	74	47	20,09	30,01	

Edmonton.

CHARLES HENRY ADAMS.

Latitude 51° 37 32 N.
Longitude 3 51 West of Greenwich.

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ASTOR, LENOX AND
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Church's Nail Making Machinery.

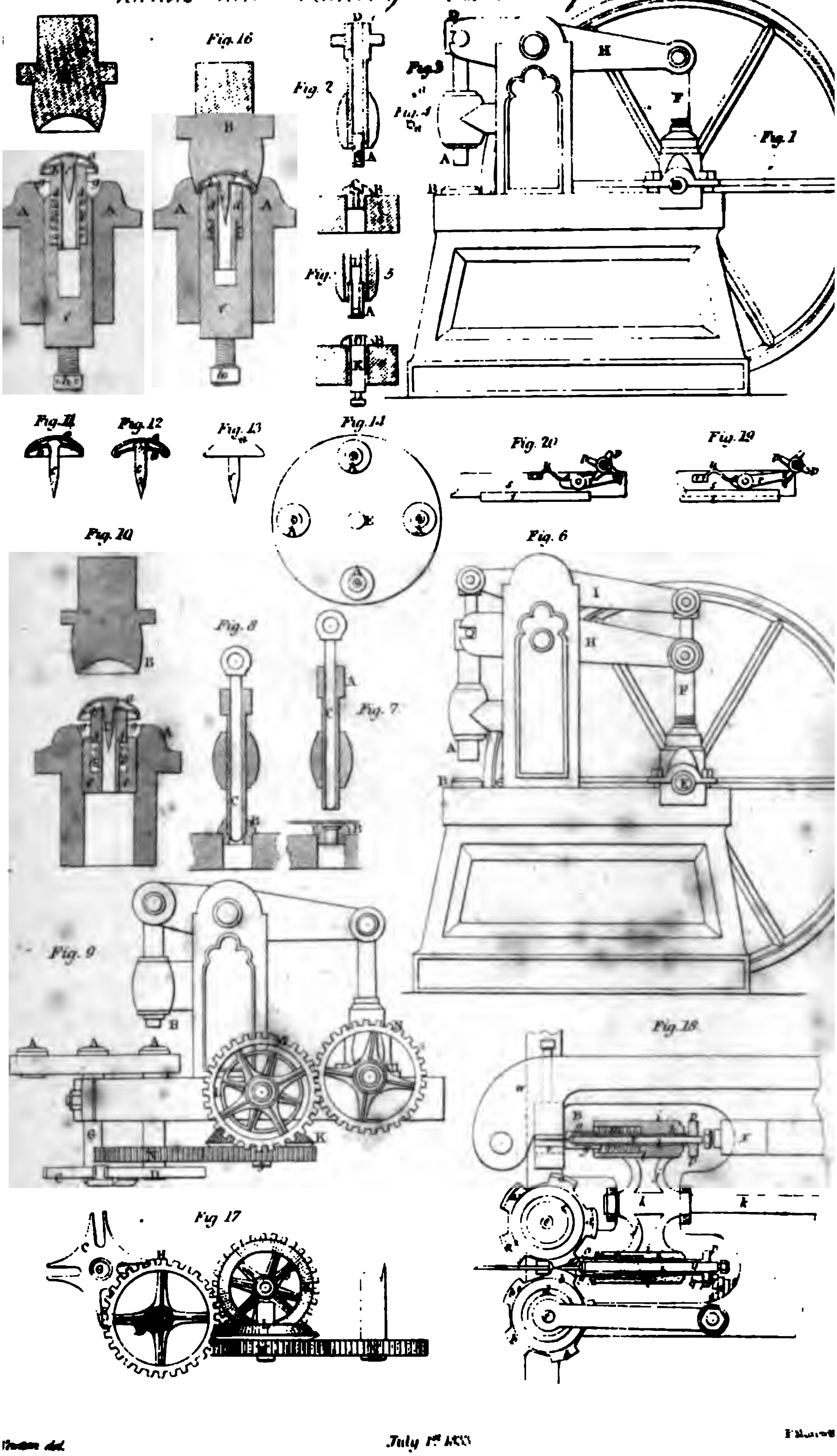

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Fig. 1.

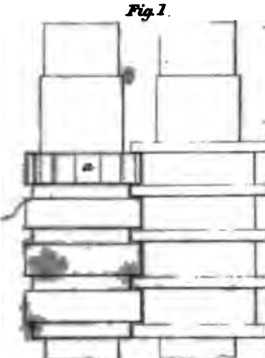


Fig. 2.

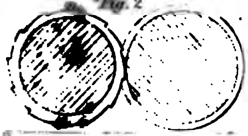


Fig. 3

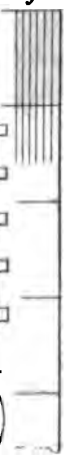


Fig. 4

Fig. 11

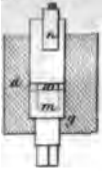


Fig. 12

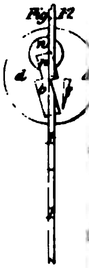


Fig.

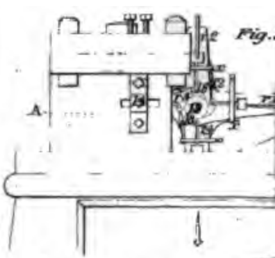
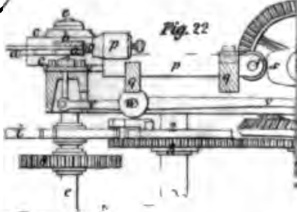


Fig. 22



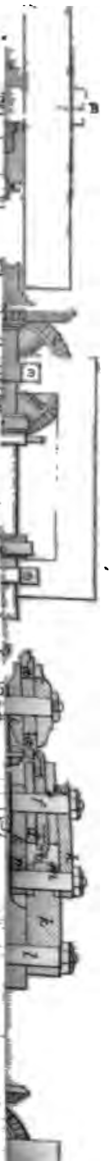
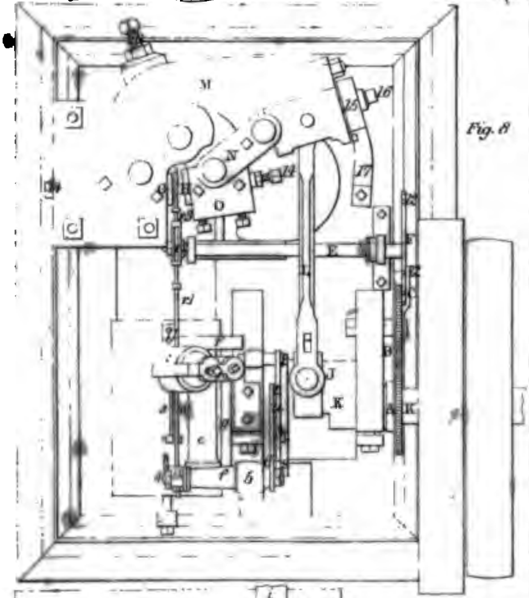
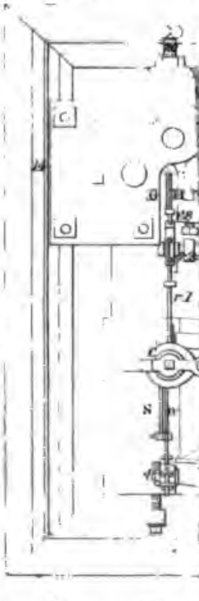


Fig. 8





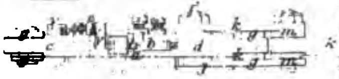


Fig. 14

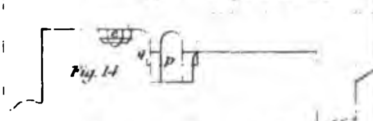


Fig. 13

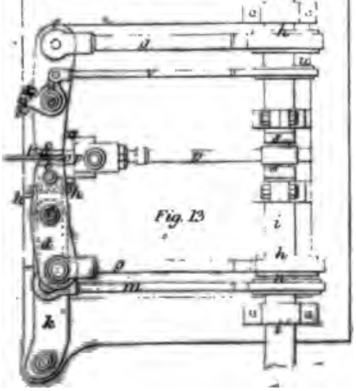
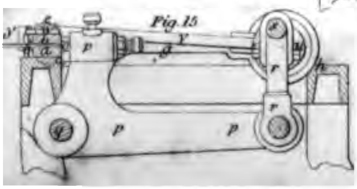


Fig. 15



THE

London
JOURNAL OF ARTS AND SCIENCES,
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OF
PATENT INVENTIONS.

No. XV.
CONJOINED SERIES.

Recent Patents.

To William Church, *of Bordsley Green, near Birmingham, in the county of Warwick, gentleman, for his invention of certain improvements in machinery for making nails.*—[Sealed 25th February, 1832.]

This invention of certain improvements in machinery for making nails, consists, first, in making, forming, and preparing the nail from rods, bars, or plates of iron, or other ductile metals, or alloys of metals. Secondly, in machinery or apparatus for converting such metal rods, or rods otherwise prepared, into nails. Thirdly, in machinery or apparatus for making that kind or description of nail for which a Patent was granted by his present Majesty to Richard Prosser, of Birmingham, on the 13th day of July, 1831. (a description of which will be found in Vol. VIII. Second Series of the London Journal, page 29.) The Patentee describes the particulars of his invention as follows :—

My method of making the rods from which the nails are to be formed, consists in preparing bar or plate iron, or other metal, by passing it through pressing rollers having indentations upon the peripheries of one or both of them, so as to form the bar or plate of metal into the required shape for the rods, which plates or bars may afterwards be separated into rods of any desired width by common slitting rollers.

Figs. 1 and 2, in Plate XV, represent a pair of rollers, which are of a similar construction to those ordinarily used for rolling flat bar iron, but having a part of the periphery of one of the rollers indented and formed into projections and curved surfaces *a*, *a*, whose radii or distances from the axis of the roller are unequal.

Figs. 3 and 4, represent horizontal and side views of a piece of plate iron or other metal after it has been passed between the indented and cylindrical rollers. The metallic plates or bars thus prepared, are separated into nail rods, as shown in fig. 3, where the plates are represented as being partly slit by means of ordinary slitting rollers. After the operations of rolling and slitting above described, it will be perceived the nail rods consist of a series of wedge formed pieces 1, 1, 1, as shown in fig. 4, each wedge piece being intended to form a nail when finished. The principal object of rolling the rods into wedge formed pieces, is to measure out a due quantity of metal proportioned to the required thickness or strength of the nail in its several parts, and which quantity depends upon the form that it may be thought expedient to give to the projections and indentations upon the peripheries of the roller or rollers.

My machinery or apparatus for converting rods of metal into nails, consists of three machines for effecting this object in different ways; and as each machine admits of variations in the arrangement or detail of its parts, I shall describe the machines separately, and state some different dispositions of the working or operative parts. The first machine I shall describe is shown in the several figures 5, 6, 7, 8, 9, 10, in Plate XV.; and its improvements consist, first, in the manner of feeding the nail rod into the machine; second, in the manner or mode of effecting the pointing and cutting off from the rod the piece which is to form the nail; thirdly, in the manner of carrying the blank or shank, when pointed and cut off, to the dies, where it is to be finished in shape, or moulded and headed; fourthly, in the mode or manner of finishing the shape of the shank, and of forming the head of the nail upon it; and, fifthly, in the manner of discharging the nail when finished.

Figs. 5, 6, and 7, are elevations; figs. 8 and 9, are plan views; and fig. 10, is a horizontal section taken through the machine in the direction of the dotted lines A, B, in figs. 5 and 6. The same letters of reference being marked upon corresponding parts in all these figures.

The nail rods 1, 1, with the thin ends of the wedges foremost, are introduced into the machine through a guide of any convenient form, and placed in the situation between the cutters *b*, *b*, as shown in figs. 5 and 10, after which it will be fed into the machine by the following means:—

On the main shaft K, is fixed the cam wheel S, which, as it revolves, raises the lever *t*, having its fulcrum in the ear 2, and its underside resting upon the cam wheel. The lever *t*, as it rises, carries with it the other lever *u*, to which it is connected by an adjustable joint 3, moving in slots in the levers. The lever *u*, is connected by its fulcrum rod 4, in the standard 5, to the lever *v*, fixed upon the other end of the rod 4. To the lower end of the lever *v*, is connected the piece *w*, its end being formed into a feeder or pusher, which, as it is moved backwards by the movement of the lever *v*, falls into the notches or recesses in the nail rod, and on being moved the reverse way, pushes against the projections or shoulders of the wedge formed parts of the nail rod, and causes them to move severally under the cutters *b*, *b*, to undergo the operation of pointing and cutting off.

The extent of the movement of the pusher can be regulated through the joint 3, of the levers *t* and *u*; and, after the feeder *w*, has pushed one of the wedge-formed pieces under the cutters, a spring, 6, draws down the levers *t* and *u*, on to a smaller diameter of the cam s, and thereby causes the lever *v*, to draw back the feeder *w*, ready to push another portion of the rod under the cutters *b*, *b*.

In order to form a point to the nail, I remove by means of cutting away a small piece, 7, from one side of the thin end of the wedges 1, 1, 1, as shown in the enlarged figure 12. The piece so cut off forms a shoe bill, and the operation of cutting off the shoe bill, which I call pointing, is performed in the following manner:—The rod being introduced through a guide, and placed between the cutters *b*, *b*, one of which is fixed in the cutter head *c*, and the other in the bed *d*.

The cutter head *c*, is mounted upon the shaft *e*, and partakes of any motion given to the shaft. At each end of the shaft *e*, on the side opposite to the cutter head, is fixed a short lever *f*, *f*, (see fig. 6.) and between these levers *f*, *f*, is a sling *g*, connected to them by pivots *h*, *h*, (shown in fig. 10); *i*, is an anti-friction roller on the small crank *j*, at the end of the main shaft K. This roller *i*, works in a groove or opening in the sling *g*, by which means, as the main shaft K, is made to revolve, the cutter head will rise and fall, and thus effect the operation, the lower cutter in the bed being stationary. These cutters *b*, *b*, stand obliquely to the rod, as shown in fig. 12, in order that a triangular piece may be cut out of the wedge piece of the rod, and at this operation the nail should not be entirely separated from the rod, unless an extremely sharp point be required. On the side of the upper cutter *b*, is another similar cutter *l*, (see fig. 5,) with its lower or cutting edge placed a little above it.

When the cutter *b*, has effected its operation, and has been carried down so that the cutter *l*, almost touches the nail, another small lower cutter *n*, attached to a cylindrical slide *m*, situated in the bed *d*, is driven up by the lever *o*, which is connected to the before-mentioned shaft *e*, by the rod *p*, shown by dotted lines in fig. 6. An adjusting screw 8, in the end of the lever *o*, regulates the height to which the cutter *n*, is moved in separating the nail from the rod. The lower cutter *n*, is stationary while the pointing cut is made. The slide *m*, which carries the lower cutter *n*, rests on a shoulder 9, in the cylinder bed-piece *d*, (see fig. 11.) The piece *m*, is made in two parts, and furnished with a screw 10, for adjusting the height of the cutter *n*. After the nail has been separated from the rod by the cutter *n*, as above described, it is thrust forward through the guide 11, into the carrying plyers *r*, *r*, (fig. 5,) by means of the pusher *s*, on the feeder *w*, (which receives its motion as before described from the cam wheel s,) another portion of the rod being at the same time brought forward to be pointed and separated as before. After the nail has been pushed into the carrying plyers *r*, *r*, it is there held fast by means of springs *x*, *x*, *x*, pressing against a tail piece 12.

upon the moveable jaw of the plyers (see fig. 5); the carrying plyers are made to perform a portion of a revolution, that is to move from the position of *r* 1, to that of *r* 2, and so on by the following means :—

On the main shaft K, is fixed a toothed wheel A, gearing with the wheel B, attached to the driving wheel C, as seen in fig. 7. The driving wheel C, has a short arm D, carrying a roller Z, which roller is situated in that part of the wheel where a portion of it has been removed, as seen in the figures. The carrying plyers are mounted upon one end of the shaft E, upon the other end is fixed what I call the star wheel F. By the motion of the wheel A, on the main shaft K, the driving wheel C, is made to revolve, and the roller Z, entering one of the grooves 13 in the star wheel F, turns it one-fourth round, where it is securely held throughout the remainder of the revolution of the driving wheel, by the part between the grooves 13 being in contract with the periphery of the driving wheel C; and thus while the carrying plyers only perform a portion, the main shaft K, performs an entire revolution, and thereby the pointed wedge-form pieces, or shanks of the nails are carried successively between the moulding dies G, H, and there held while the operation of moulding and heading is performed. These dies being furnished with adjusting screws 14, 14, by which their proper position may be determined.

The parts of the apparatus for moulding and heading will be best seen in the section in figure 10, where a blank is represented in a position to be operated upon. By the revolution of the main shaft K, the crank J, through the medium of the connecting rod L, pulls towards it the lever M, which being connected by the bars N, to the moveable die block O, the dies are brought together with sufficient force to shape or finish the shank part of the nail, at the same time holding it firmly, while the heading pin P, is forced up by the lever M, and compressing a part of the shank, forms the head: the heading pin P, being furnished with an adjusting screw 20. On the further progress of the crank J, the dies recede from each other, and the carrying plyers are again brought into motion by the means before described, and the finished nail carried out of the heading dies and another taken into its place. On the end of the lever M, is mounted the anti-friction roller 15, moving upon a short axle 16, and running upon the rail 17, by which means the lever M, will be made to move freely and in proper position to the heading dies.

In passing from the station where the nail is headed to the lower station where it is discharged, a tail piece 18, on the jointed end of the moveable jaw of the carrying plyers *r*, *r*, comes into contact with the fixed pin 19, and moving it outwards, opens the plyers, when the nail is allowed to fall away below. It should here be remarked, that although the carrying plyers should be made thinner than the nail where they rest between the dies while the heading is performed, they should be strengthened on each outer edge.

The second machine for converting rods of metal into nails is shown in the several figs. 13, 14, 15, 16, and 17. Fig. 13, is a plan view of the working parts of the machine for effecting the moulding, heading, and cutting off. Fig. 14, is a front view, and fig. 15, a verdical section; figs. 16, and 17, are plan views of the dies in different positions, the same letter of reference being marked upon corresponding parts in all these figures. In this machine the moulding and finishing of the shank of the nail is obtained by a reciprocating rotatory motion of the moulding dies, instead of the direct pressure in the foregoing machine. The nail rods may be prepared in the manner described under the first head of this specification, or they may be passed through a pair of rollers as shown in figs. 18 and 19.

The indentations upon the peripheries of these rollers will cause the rod to take the form shown at *a, a, a*, fig. 18; that is, with an enlargement on the ends of the wedge-formed pieces, which will assist the operation of heading.

The moulding dies *a, b*, are mounted in the ends of levers *c, d*, turning upon axles *e, f*, as their fulcrums, and are moved by connecting rods *g, g*, and cam wheels *h, h*, upon the main shaft *i, i*; and in order to open the dies (as shown in fig. 16), so as to admit the rod of metal between them, the axle *f*, is mounted in a sliding piece *j*, (shown by dots in fig. 14), moving in guides in the frame work of the machine. To the axle *f*, is connected one of the toggle jointed levers *k, k*, and the other to a pin *l*, fixed in the frame work. The manner of constructing these toggle joint levers is shown best in fig. 14, they being partly removed in the other figures to expose the other parts of the machine. To these toggle levers is connected a bar *m*, actuated by a cam *n*, on the main shaft which draws the bar *m*, and levers *k, k*, towards it to open the dies; and on the nail rod being brought between the dies (as shown in fig. 16), by a proper feeder, or any other convenient means, the cam *n*, pushes back the bar *m*, and the levers *k, k*, into the position shown in fig. 13, and cause the dies *a, b*, to hold the nail rod firmly while the heading is performed. The heading die *o*, is mounted on the end of the short arm of the lever *p*, which turns on an axle at *q*; the other end of this lever *p*, is connected by the coupling piece *r*, to the crank *s*, upon the main shaft *i*. By the rotation of this crank the heading die is brought up against the moulding dies *a, b*, (as shown in figs. 13, and 14), with sufficient force to form the head of the nail, which being completed, the heading die *o*, recedes from out of the way of the dies *a, b*, as they proceed to mould or finish the shaft, which is effected by the cam *h, h*, pushing forward the bars *g, g,* thereby moving the levers *c, d,* into the position shown in fig. 5, and at the same time pressing or moulding the nail rod into the required form, and completing the shaft of the nail, which may be separated from the rod by the cutter *t,* mounted in the lever *c,* sliding in a groove therein, which is made to cut off the nail from the rod by the cam wheel *u,* pushing forward the bar *v,* connected to the bent lever *w,* having an adjusting screw *x,* pressing upon the vertical cam *y,* of the cutter *t.*

After the nail has been separated from the rod, the bar *m,* and cam *n,* cause the toggle levers *k, k,* to open the dies, when the nail will be at liberty to fall away. The bar *g, g,* and cams *h, h,* bringing the levers *c, d,* and moulding dies *a, b,* into the position shown in fig. 16, and the cam *u,* drawing back the bar *v,* and lever *x,* allows the cutter *t,* to be brought back into its former position by a spring or any other convenient means. The manner of constructing the moulding dies is shown on an enlarged scale in the sectional fig. 20, where it will be perceived that they overlap each other, so as to give the nail the required form; but I do not mean to confine myself to that particular construction, as in some cases the dies may be used without the overlaping parts. An adjusting screw is placed behind the heading die *o,* and wedge formed pieces *z,* in the lever *d,* to adjust the moulding dies, or they may be adjusted in any other convenient manner. The third machine for making nails from rods of metal, is shown in the several figures 21, 22, 23, 24, 25, 26. The operation of moulding and pressing the shank of the nail into the required form in this machine, is obtained by an interrupted rotatory motion of a series of dies placed in a wheel instead of the reciprocating rotatory motion and described above.

Fig. 21, is a plan view of the working parts of the machine, with the moulding dies *a, b,* shown in their position when holding the nail rod while the heading is performed. Fig. 22, is a vertical section of the same. Fig. 23, is a similar view to figure 21, with the dies in the position after the heading and moulding of the shank is performed, and the nail ready to be separated from the rod. Fig. 24, is a section of the same. Fig. 25, is a section, taken in the direction of the dotted lines A, B, in figure 21, and showing the manner of constructing the moulding dies *a*, *b*, which are mounted in strong plates or wheels *c*, *d*, fixed upon the shafts *e*, *f*, and are brought together for holding the nail rod, while the heading is performed, and for pressing or moulding the shank, by means of the toggle jointed levers *k*, *k*, and cam wheel *n*, and rod *m*, as described in the foregoing machine. The heading die *o*, is mounted in the end of the sliding bar *p*, moving in bearings in the cross pieces *q*, *q*, of the frame work, and is actuated by a cam wheel *s*, on the main shaft *i*, pressing against a friction roller *r*, on the end of the sliding bar *p*. This manner of working the heading die *o*, shows another mode of performing the heading of the nail; but a lever and crank may be used instead, as in the foregoing machine. The cutter *t*, for separating the nail from the rod, is placed vertically in the framing of the machine, and is actuated by a lever *v*, turning on its fulcrum *w*, on the cross bearer *q*: the short end of this lever is connected to the cutter *t*, its other end having a friction roller *x*, against which the cam *u*, acts, depressing this end of the lever *v*, and raising the short end, and with it the cutter *t*; thereby separating the nail at the time the moulding dies have finished the shank of the nail; after which the cam *u*, ceasing to act upon the friction roller, allows the lever *v*, to be brought into its former position by a spring or weight. It will be seen that the moulding dies *a*, *b*, are mounted radially in the plates or wheels *c*, *d*, and on one pair of dies completing a nail, they must move round a part of a revolution, to allow of the next pair of dies to come into operation. To effect this movement, I give them an interrupted rotatory motion, by means of the star wheel 1, mounted upon the shaft *e*, and which receives its motion from the driving wheel 2, as before described.

The driving wheel is actuated by the toothed wheel 3, which takes its motion from another wheel 4, upon the shaft 5, of the bevel wheel 6, which gears into another bevel wheel 7, upon the main shaft *i*. The shaft *e*, gives the interrupted rotatory motion to the other shaft *f*, by means of the pair of toothed wheels 8 and 9, the teeth of which should gear sufficiently deep one within the other, so as to allow of the shaft *f*, and dies *b*, sliding, to open them without throwing the wheels quite out of gear. It will be observed that the two last described machines are not constructed to make any but what are called chisel-pointed nails, from the moulding dies giving pressure only on two sides of the nail rod. It will also be observed that if the nail rod was passed through a pair of dies where a portion of the point was removed, as described in the first machine, then these machines would be capable of finishing the nail shank into a point; but as it is not always desirable to remove a portion of the rod, the nail, as soon as formed by these machines, may be carried away to another pair of moulding dies, where the nail may undergo a second pressure on the other two sides pressed by the moulding dies, and the point be thereby completed. As there are many ways of conveying the nail from the moulding dies to a second pair of dies, by carrying fingers, spring clips, &c. either sliding or rotating, I have not thought it necessary to describe any particular method, but have shown in fig. 26, one mode of effecting this object. In this figure the moulding dies *a*, *b*, are shown open, and the nail rod in the situation for them to close upon it to form another nail. The cutting off under these circumstances is not effected until it is placed as there shown, when the cutter *t*, may effect the operation in any convenient way. 1, 2, are a pair of carrying fingers or spring clips, mounted in a bar 3, sliding between the guide arms 4, fixed on the axle 5; this axle has an interrupted rotatory motion communicated to it by a star wheel, or any other convenient manner by which it will bring the carrying finger 1, 2, alternately opposite the nail as it is delivered from the moulding dies *a*, *b*. Upon the back of the bar 3, are two studs or pins 6, 6, which are also brought by the motion of the shaft 5, between the forked end of the lever 7; at this time a projection upon the cam wheel 8, fixed upon the shaft 5, causes the lever 7, to move outward, and slide the bar with the pair of fingers 1, on to the nail just before it is cut off from the rod; and by the motion of the shaft carry it over into the second pair of moulding dies 9; when another projection upon the cam 8, will move the lever 7, away, and the bar 3, and with it the spring clips 1, leaving the nail in the second moulding dies, which have previously taken fasthold of it.

The second pair of moulding dies may give their pressure to the nail by means of any of the different motions of the moulding dies *a*, *b*, as before described, or in any other convenient means which it is not necessary here to describe.

It will be evidently seen by all competent mechanics, that the moving parts of these machines may be altered considerably in their arrangements; for instance, the lever *c*, and *d*, in fig. 13, may be connected together by toothed wheels, fixed upon the axle *e*, *f*, as described in fig. 21, so that these movements may be simultaneous, and only one rod *g*, and cam wheel *h*, be necessary. Also, that the heading dies may be mounted upon sliding bars, actuated by cam wheels, or in levers moved by cranks upon the main shaft, and that the moulding dies be made to open and shut otherwise, than by toggle jointed levers and bars, and yet the motion and effect of the dies remain the same—for instance, they may be connected together by a strap, loop, or bar, which may be placed upon either of the axles *e*, *f*, and upon the other an eccentric or cam, working in the connecting strap or bar, which will bring the dies together at the time the heading or moulding of the shank is performed, which will assist that operation, and also be made to open them when necessary.

My improvements in machinery for making or forming that kind or description of nail for which a Patent was granted by his present Majesty to Richard Prosser, of Birmingham, on the 13th day of July, 1831, a description of which will be found in the Specification of that Patent, consist in the peculiar formation or construction of the dies, punches, or tools for effecting the different required operations, and as they may be worked to good effect in several different ways, I have shown in Plate XVI, figs. 1 to 16, several different machines or methods of using them. Fig. 1, represents an elevation of one of the machines for forming the blanks or parts which constitute the head of the nail.

The tool or punch which cuts out the piece to form the head of the nail from the rolled sheet metal of any description proper for the purpose, is shown at A, and the bed or counter die against which the tool or punch cuts is shown at B, both being shown in section at fig. 2. The tube or punch is made to descend until it enters the bed or counter die, which is stationary. The punch is hollow, and equal in internal diameter to the head of the nail intended to be made. The part C, which is fixed into the bed B, is of a diameter somewhat smaller than the inside diameter of the tube or punch A, and of the same form which is intended to be given to the head of the nail; the end of the punch A, is made conical on the inside, so as to bring it to a cutting edge all round its circumference, the sheet of metal being placed between the punch A, and counter die B. Motion being given to the machine by any convenient means (such as the crank shaft E, connecting rod F, and lever H,) a circular disc or blank will be cut out of the sheet of metal, equal in diameter to the outside of the punch. The blank so cut would pass down into the bed but for the interposition of the piece of metal C, which obstructs the passage of the blank. The punch A, continuing to move downward after having cut out the blank, presses it on to the head of the piece C, and obliges it to take the same form while its edges are forced down by the inside of the tube or puch A, into the space between the piece C, and the inside of the die B, into the form shown in section at *a*, fig. 3, and in plan fig. 4. The blank G, in consequence, being equal in diameter to the inside of the tube or punch A, on its receding from the bed, carries the blank just formed with it. A few of the blanks *a*, *a*, so formed are exhibited, in the tube A, fig. 2, and are pushed upwards in succession by each succeeding blank, until they arrive at the top D, when they are allowed to fall into a receiver.

The piece C, in the dies B, may be made to move upwards and meet the punch A, after it has cut out the disc of metal by a lever, worked from the crank shaft forcing up the sliding piece K, in which the piece C, is mounted, shown in the section at fig. 5, thereby producing the same effect upon the disk, and forming the same shape blank. The blank C, may be removed out of the punch A, without its having to travel up it by the rod L, being pressed down by a lever connected to the crank shaft, or any other convenient means which will push the blank out of the punch, and allow of its being removed out of the way.

Another mode of forming these blanks is exhibited in which fig. 6, is an elevation of a machine, having the piece C, which forms the hollow or cup of the blanks placed within the punch A, as shown in the detached sections, figs. 7 and 8, and another lever I, to work it.

On the punch A, descending and cutting out the disk of metal as before described, the lever I, by means of the crank shaft causes the piece C, to descend and force the disk of metal into the dies B, and on its meeting with the smaller diameter of the hollow of the die, the disk is forced down by the piece C, (as shown in the section fig. 8), and out through the die B, thereby producing the same formed blank as before described.

Fig. 9, represents a machine for combining the different parts of these kinds of nails so as to constitute a complete nail. The pieces *b*, *b*, which form the back or underside of the head of the nails, may be formed by any convenient machine, and placed on to the beds A, A, fixed on to the revolving bed plate E, shown detached in fig. 14. A shank formed by the machinery above described, or by other means, is put through the hole in the centre of the back piece *b*, and the blank or part which forms the head *a*, (and which has been prepared as just described) is then placed over the shank *c*, and back piece, as shown in section in figs. 10 and 11, and being carried under the punch or tool B, remains stationary while the punch descends to unite the parts to form the nail, which is done by the peculiar formation of the tools or punch B, and dies A, as shown in section fig. 10, the nail when finished being shown in section at fig. 12, and in elevation at fig. 13.

As the punch B, descends, it first comes in contact with the head of the nail *a*, placed upon the piece *d*, (see fig. 10,) which piece is supported by a spring *e*, in the socket piece *f*, resting upon shoulders in the bed A; and as the punch descends, it carries with it the parts of the nail, and the piece *d*, and enters the recess *g*, in the bed A, the peculiar form of which recess causes the edges of the head piece *a*, to turn in under the back piece, and thereby firmly unite the whole of the parts of the nail together.

The punch B, now ascends: the nail, and bed containing the nail, with the bed plate, move a part of a revolution, according to the number of dies placed upon the bed plate E, and another die is brought under the punch B, the parts forming the nail being placed in the revolving beds during the time they remain stationary, so as to be operated upon in succession. It will be perceived these beds must have an interrupted revolving motion, which I communicate by the star wheels C, and driving wheel D, already described, the bed plate E, being placed upon the upper end of the shaft G, of the star wheel C, see fig. 17. The driving wheel D, receiving its motion through the toothed wheel H, on its axis I, this wheel receives motion from a toothed wheel J, upon the back of the mitre wheel K, which takes into another mitre wheel L; upon the back of the wheel L, is another toothed wheel M, receiving motion from the driving wheel N, fixed upon the crank shaft. The punch or tool B, is actuated in the same way as that just described.

Fig. 15 and 16, are sections of the dies A and B, where the socket piece *f*, is made capable of being moved upwards, so that its upper part may assist in turning in the edges of the head piece *a*, under the back piece *b*, shown in fig. 16, which may be effected by a lever placed in any convenient part of the machine pressing upon the adjusting screw *h*.

I must here observe that the parts of the above described machines for making these peculiar kind of nails, admit of a variety of different arrangements, and although here described as separate machines may be placed upon one framing, receiving motion from one crank shaft, or the parts may be changed in position. The dies A, A, for instance, may be placed upon the periphery of a strong wheel, or revolving plate, which may receive an interrupted rotatory motion through the star wheel, driving wheel, and bevel wheels, as before described; or instead of a rotatory bed plate or wheel, a bed plate or bar may be used and moved backwards and forwards, bringing the die A, under the punch B, in succession, by a lever actuated by any conveni entmeans, as by a step formed cam wheel upon the main shaft.

In conclusion I must remark that the same effect, as is produced by the second pair of moulding dies for finishing and pointing the nails formed by the machines above described, and shown in Plate XIV., may be obtained from one pair of moulding dies by the nail having a motion given to it by which it will be turned over, and its different sides presented to the pair of dies for pressure. This may be done by causing a pair of plyers or spring clips to take fast hold of the nail shank, and by giving them a reciprocating rotatory, or interrupted rotatory motion, they may be made to turn the nail one quarter of a revolution, by which the other sides of the nail shank, to those first operated upon, will be presented to the dies.

In machines where this is effected, it is obvious the heading die must be made to move sufficiently out of the way to allow of the necessary parts being introduced, and in some cases it would be desirable to remove the heading operation away from the moulding dies *a*, *b*, and perform it in some other part of the machine, where another pair of dies may be made to hold the nail shank, while the heading is performed. Fig. 18, represents a horizontal section of part of a machine where these two operations are effected; *a*, *b*, are the moulding dies mounted in the wheels *c*, *d*, turning upon the axles *e*, *f*, as before described.

The nail shank in this machine is separated from the rod, before it is headed; but previously to this being effected, a pair of spring clips or carrying fingers *g*, *g*, are made to take hold of the shank. These spring clips are mounted in the tube *h*, which slides in the carrier piece *i*, *i*, connected by arms *j*, *j*, to the shaft or axle *k*, *k*, which has an interrupted rotatory motion as that described under fig. 26, Plate XV,. by which means the spring clips will alternately be brought into the position at A, and take fast hold of the end of the nail rod. The dies *a*, *b*, having also taken hold of it to effect the moulding, and as they proceed to form the shank, it is with the spring clips *g*, *g*, pushed back into the position shown in the fig. at A. And on the cutter *l*, separating the nail shaft from the rod, and the dies *a*, *b*, opening the spring *m*, placed within the hollow *n*, of the carrier piece *i*, *i*, (by acting between the shoulder *o*, on the tube *h*, and the back of the hollow *n*,) will push the spring clips and nail shank into their former positions, and on being turned over one fourth of a revolution, will be ready to receive a second pressure from the next pair of dies *a*, 2, *b*, 2.

This turning over of the nail shank is effected by the following means:—Upon the end of the tube *h*, are fixed the arms *p*, *p*, (see the detached sections of the tube, figs. 19 and 20.) These arms are alternately acted upon by a pin *q*, fixed in a small lever *r*, attached by a joint to the bar *s*, sliding between the grooves *t*, *t*. On the motion of this sliding bar upwards, the pin *q*, comes in contact with one of the arms *p*, as represented in fig. 19, and forces it upwards into the position shown in fig. 20, thereby moving the tube *h*, one quarter of a revolution, and consequently with it the spring clips *g*, *g*, and nail shank, which will thereby be made to present its other two sides to the dies *a* 2, *b* 2, to be operated upon.

As the sliding bar *s*, descends to effect the turning of the next nail shank, the pin *q*, passes over the arm *p*, below it, without disturbing it. The small spring *u*, which presses against the tail piece of the lever *r*, allowing it to move outwards to pass the arm *p*. After receiving a second pressure, the shank will be ready to be carried to the heading dies *v*, which is effected by the movement of the shaft *k*, and will then be in the position at B, that is, within the dies, they being open to receive the shank; and on their closing upon it by means of the lever *w*, (which carries one of the dies), the heading bar or leaver *x*, is forced forward by any of the means before described, pushing the heading pin or die *y*, (mounted within the tube *h*,) up against the dies *v*, compressing the end of the shank and forming the head.

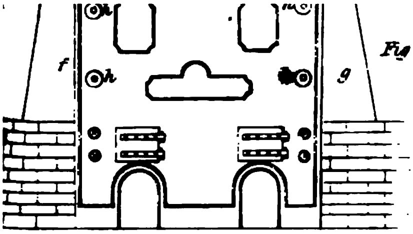
The inclined-plane parts of the spring clips causes them to open and make way for the heading pin as it is pushed forwards. On the nail being completed, the heading bar or lever *x*, is drawn back, and the lever *w*, moved outwards, opening the dies *v*, when the nail is allowed to fall away below, the dies *v*, then being ready to receive another nail shaft, to be brought into them by the next pair of spring clips *g*, *g*.—[*Inrolled in the Rolls Chapel Office, August*, 1833.]

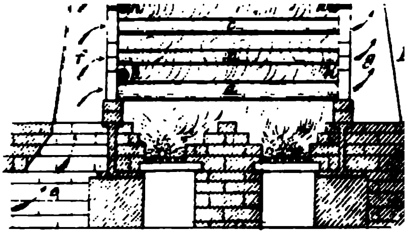
Specification drawn by Mesrs. Newton and Berry.

To Joseph Gibbs, *of Kent Terrace, Kent Road, in the county of Surrey, engineer, and* Augustus Applegarth, *of Crayford, in the county of Kent, calico printer, for certain improvements in steam carriages.*—[Sealed 29th September, 1832.]

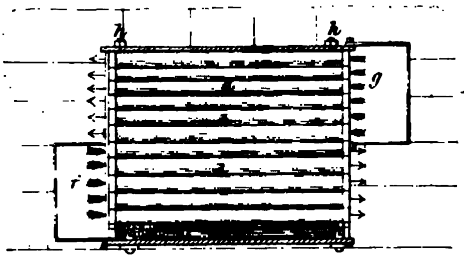
A report of this Patent was given in our last, at page 277, but owing to the absence of the Editor (at that time engaged on business in a distant part of the kingdom), one feature of the proposed improvement, and the claims of the Patentees were, through inadvertency omitted; we now beg to correct that error, by adding the following to the former report.

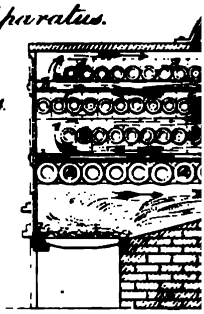
Another variation in the construction of a boiler, suited to the generating of steam for locomotion and other purposes, (denominated a *cone-cylinder*), consists in a peculiar mode of forming the internal part of the boiler, so as to expose a much more extended surface to the action of the fire. Plate XIV. fig. 5, is a section taken longitudinally through the boiler, showing the *cone-cylinder* within; *a, a,* is the casing, or outer part of the vessel which is proposed to be held together internally by tie bolts, or cross bracings; *b* are the bars of the furnace; *c*, the steam chamber intended to be furnished with an apparatus similar to that already described, for separating the steam from the water, and it may have a waste-chamber, as shown at figs. 1 and 2; *d*, is the descending flue, which, instead of being formed of copper tubes as the boiler before described, is constituted by an inner casing bent into the forms of hollow cones, the apexes of which may meet or pass each other in the centre of the cylinder, in order that the fire and heated air, as it passes down the interior of the cylinder, towards the chimney *e*, may act upon every part of the surfaces of the cones.





Garsed and Robinson's Heating Apparatus.





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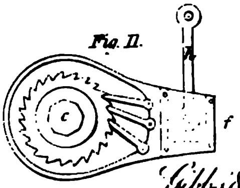

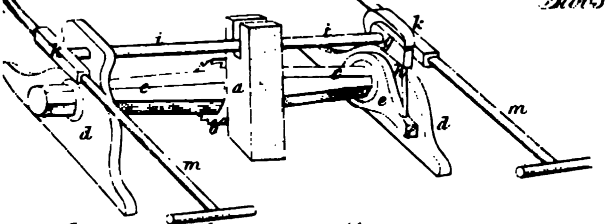

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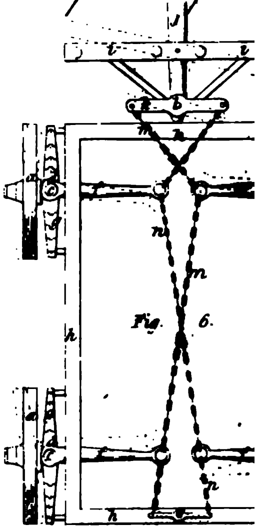
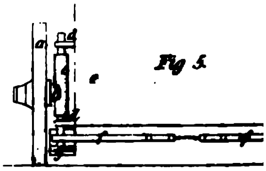
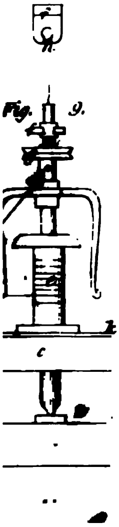
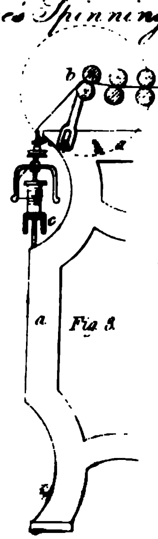
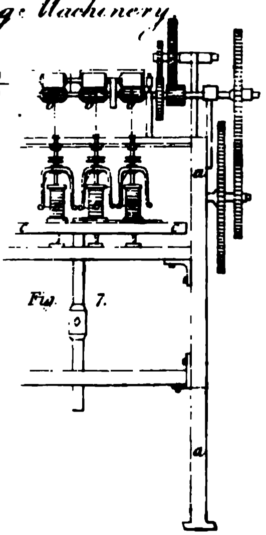




Jellicorse's Spinning Machinery.







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The object of the cones, it will be perceived, is merely to obtain an extended surface of the water vessel, upon which the fire and heated vapour is to act; and, therefore, they may be arranged in various ways, as circumstances shall require, either with a descending current for the fire and heated vapour, or an ascending or horizontal current, or with either or both combined.

The cones may be made to project from the water vessel, as shown in the figure, or they may be arranged directly over the fire, or above the current of heated air, as well as placed around the current, it being impossible to describe all the variations of arrangement of which the plan is susceptible.

The proportions of the surfaces of the cones to their bases may be varied, and it may be better that those cones which are nearest to the fire should be more obtuse than those which are more distant, in order that the steam may escape more readily.

It is not necessary that these projections should be precisely of the forms of cones; for instance, they may be wedge-shaped prisms, or hopper shaped, or parallelograms having rounded edges, or of any convenient form which can be connected by its base to the boiler or vessel containing the water.

These boilers may be made of cast or of wrought iron, welded or riveted, or of any other suitable materials, and the outer casing of any convenient figure. It should, however, be observed, that the whole of the cylinder *d*, is to be furnished with circles of cones in the manner shown in fig. 5, and also in the horizontal section, fig. 6, having pipes to convey the water from the upper part of the boiler to the lower part, in case any of the other passages should be obstructed by the rising of the steam. There must also be a pipe by which the boiler may be fed by a force pump in the usual way.

"Lastly, the improvements for which we claim the protection of His Majesty's Royal Letters Patent, consist first, in the new arrangement and conbination of the various parts of a steam carriage, as shown in the different figures; secondly, in the new arrangement and construction of a boiler, consisting of double casings and hollow cones filled with water as above described; thirdly, in the combination of shafts, wheels, couplers, and springs, as shown in figs. 1 and 2, for the purpose of obtaining two or more rates of motion in the road wheels of steam carriages, while the pistons of the engines continue to move at a uniform rate. And, fourthly, in the propelling or pushing any vehicle on the common roads by means of a steam carriage, consisting of a boiler, engines, and moving apparatus, as above described, which steam carriage may be entirely separated and removed from the said vehicle in contra-distinction to drawing or pulling any such vehicle; but we do not confine ourselves to the particular modes of application herein shown."—[*Inrolled in the Inrolment Office, March,* 1833.]

To John Walmsly, *of Manchester, in the county of Lancaster, silk-winder, for his having invented a machine for cutting off fur or hair from beaver and other skins.*—[Sealed 15, March, 1832.]

This invention is a machine for cutting the fur from beavers and other skins for the use of hatters, and consists principally in the adaptation of a pair of revolving fluted rollers, which draw forward the skins in a distended form, and conduct them over an edge rail, where the furry side is presented to the action of a cutter which slides to and fro in a horizontal frame.

The general construction of the machine will be understood from the front and side elevations shown in Plate XIV. at figs. 7 and 8, but it appears to us that a section taken through the middle would have been more eligible, as we are not enabled by the views appended to the specification to discover the situation of the cutter, or of edge or ledger blade, as it would be technically called, against which the cutter acts.

The main rotatory shaft *a, a,* is to be put in motion, either by the winch or handle, or by a band passed round the rigger *b*. At one extremity of this shaft is attached the fly wheel *c*, for the purpose of regulating or equalizing the motion; and upon the same shaft also is fixed the cam or excentric wheel or snail *d*.

The feeding rollers between which the skins are conducted, are shown at *e, e;* the upper one bearing upon the lower and pressed down by weighted levers. The rotatory motions of these rollers are connected together by spur wheels *f*, at their ends.

The carriage of the cutter is partially seen at *g*, sliding in grooves in the standard. It is made to reciprocate to and fro by means of the rod *h*, which is connected at one end to an excentric pivot, fixed in an arm of the fly wheel, and at the reverse end is attached by a joint to the sliding cutter frame.

The operations of the machine are these: the skin passed between the rollers, is distended and brought over an edge rail, the furry surface being presented toward the knife; rotatory motion is then given to the shaft *a*, which, by carrying round the snail or excentric wheel *d*, causes the larger diameter of the snail to depress a lever connected to the click *i*. By these means the click is made to push round the ratchet wheel *k*, the distance of one tooth; and this ratchet wheel being fixed on the end of the lower drawing roller *l*, gives to both drawing rollers a small degree of rotatory motion, which advances the skin a trifling distance. At every rotation of the shaft *a*, the same depression of the lever and click *i*, takes place, they being raised again by a spring as soon as the force of the snail is removed, consequently a succession of these depressions at intervals, gives to the ratchet wheel a rotatory movement, and causes the drawing roller to conduct the skin gradually through the machine over the edge rail against the reciprocating cutter, for the purpose of having the fur shorn off from its entire surface.

By the same rotatory action of the shaft *a*, the fly wheel *e*, affixed to its end, is driven round; and the rod *h*, connected by a joint to the fly-wheel, is made to perform a reciprocating movement; and the reverse end of this rod being also by a joint connected to the frame of the cutter *g*, the frame is by that means made to reciprocate, and to conduct the knife to and fro across the machine, against the edge of the distended skin, from which the fur is shorn off as it passes.

There is a provision to keep the edge of the knife sharp by means of some steel rods, which bear against the edge of the knife, and by the friction as the knife passes to and fro, the continued sharpening is produced; but the exact situation of these sharpeners does not clearly appear from the Specification.

The concluding paragraph runs thus—"having described the construction and method of operating with my invention of a machine for cutting the fur off beavers, and other skins, I do not claim as of my invention, any of the separate or well known parts of which my machine is constructed; but I do claim as my invention, the general arrangement of the whole, together with the application of sharpeners as described, to a machine for cutting furs from skins, all which I believe to be new, and never before practised in this kingdom.—[*Inrolled in the Inrolment Office, September*, 1832.]

Original Communications.

MAJOR SHAW ON A CORPORATE COMPANY TO PROTECT INVENTIONS.

To the Editor of the London Journal and Repertory of Arts.

SIR,

OBSERVING in the public prints that the Patent Laws are under revision, allow me to offer a few observations on the subject, leading to a point which has not been discussed.

I beg to acquaint you that about two years ago, I convened, with some other gentlemen, a public meeting by advertisement, to be held at the Crown and Anchor Tavern, Strand, London, for the purpose of framing a petition to the legislature to abolish the present Patent Laws, and to reduce the price of Patents, so that every poor mechanic would be enabled to take out a Patent for their Inventions. The meeting was eventually removed to the Theatre of the London Mechanics' Institution, in Southampton Buildings, Chancery Lane, as a more convenient and appropriate place, and the meeting was very fully attended.

Lord Clanricarde was invited to take the chair; and, upon his Lordship declining, I was nominated to that office. The result of this meeting was the appointment of a Committee to draw up a Petition for the signature of such as would sign it, to be presented to Parliament; but in consequence of many of the members appointed to this Committee not being able to leave their respective occupations to attend, the business came to nothing. I therefore gave up the chair to Dr. Birkbeck, and I believe nothing was done. I however gave the Committee a plan, which was to petition Government to abrogate the present Patent Laws, and to constitute in their place a Chartered Company, to be called "The Mechanical Inventions Company," similar to the Chartered Stationery Company, and that no Patent to be deemed good or legal unless taken out from this Company, according to the rules and regulations of the Company, which required the Patentee to bring a model or drawing of the article he wished to take out a Patent for, to pay (say) ten or twenty pounds as the tax to Government, and one pound ten shillings more towards the expenses of the Company, for building or renting premises for the models and drawings of each Patentee sent to the Company, and for other incidental expenses.

This Chartered Company to be under the management of a Governor, Vice-President, a Managing Committee of twelve persons, with a Treasurer, a Secretary, and a sufficient number of Clerks. Enclosed I send a more ample detail of the rules. If the expense of a Patent exceeds ten or twenty pounds, it will afford no relief to the poor mechanics, and the Patent Laws had better remain as they are. Government will receive a much greater revenue from Patents by adopting my suggestions, for then one hundred Patents will be taken out for one by the present laws.

I have myself seven different models and drawings ready for Patents,—first, for propelling ships at sea; second, for an easy and readier manner of heaving up anchors on board ships; a third, an improvement in the sails of ships; a fourth, for a machine in agriculture; a fifth, an improvement in the draught of carriages; a sixth, a bridge for crossing broad and rapid rivers; and the seventh, a defence on board merchant ships against being boarded by pirates and others, when in harbour or at sea. Now, taking each Patent at the present price of Patents for the three kingdoms. viz. £400, it will cost me £2800 for my seven Patents, which is too great a sum for any person to risk, let them be ever so independant. It is true if one of them served I should be reimbursed, but if not, what a sum to lose.

Such a Company would not infringe upon any other Company, and therefore could not create jealousy, but confer a lasting benefit to every poor mechanic. I perused both Mr. Godson's and your Birmingham and Leeds (Improvement) Bills on the Patent Laws, but both appear to me to favour too much the lawyers. Why not do without lawyers?

In entering a book in the Stationery Company, the author or proprietor has nothing more to do than to leave eleven copies of his book at their office, pay two shillings and sixpence to the Secretary, and get his receipt for the same; his work or book then becomes his sole property, and no one dares to sell them without his permission; all this is effected without the expence of employing lawyers. Why not give the poor industrious mechanics the same advantage?

Government would lose nothing by the adoption of such a plan; on the contrary, a great saving would accrue to the public by abolishing the Patent Offices, and all the expences attached to those establishments, besides the expence of collecting the tax on Patents, as this Company would take that responsibility upon themselves, and be accountable to Government for the same; and to the poor mechanic it would be more beneficent than any manner that could be suggested for the grievance complained of by every person respecting the present Patent Laws.

It is the fault of the mechanics themselves that the present arbitrary laws on Patents remain in force—they are, in fact, a complete prohibition to every poor mechanic taking out a Patent, for scarcely one out of one hundred individuals can pay the present enormous sum for a Patent, by which many a useful invention is lost to the public.

In suggesting this Chartered Mechanics' Company, I have the Chartered Stationers' Company for my model; I am the author of two books on different subjects, which I have entered at Stationers' Hall, for which I paid only three shillings each book, without the aid of any lawyer, and they were as secure to me as any Letters Patent are to a Patentee.

I beg to submit this letter to the consideration of the gentlemen and members of the Committees interested in the Patent Laws, in the hope that some good from it may arise.

I am, Sir,

Yours, &c.

H. SHAW.

Grove Place, Brompton.

SUGGESTED RULES

For a Chartered Mechanical Invention Company.

THE Company to consist of a Governor, a Vice-President, a Managing Committee of twelve persons (Patentees if possible), a Treasurer, a Secretary, Clerks, &c.

The President to be chosen every three years out of the Committee of twelve; no President to be re-chosen until the whole of the Committee have been President; the Vice-President to be chosen for life, and to receive a stipulated salary; the Treasurer, Secretary, and Clerks also to receive salaries.

The President or Governor, and eight of the Committee, with Vice-President, to constitute a General Board.

The Vice-President, and ten of the Committee, to constitute a General Board.

The whole must attend to constitute a full Board.

Rules for taking out a Patent.

ARTICLE Ist.—Every person taking out a Patent, must bring with them either a Model or Drawing of their Invention, to the Office of the Company, together with a full written description of their Invention, with their name signed by themselves and two witnesses, and at the same time to pay £10 (or £20) as a Tax to Government on Mechanical Inventions; and £ 1. 10s. more towards the expenses of the Company for the renting or building premises, registering the Patent, and for the salaries of the Vice-President, Treasurer, Secretary, and Clerks.

II.—On paying the requisite fees and lodging the Model or Drawing, and written Descriptions of their Invention, the Patentee will receive a printed document, signed by the President and Secretary of the Company on parchment, being the Patent of his Invention, and as a security for the same.

III—The Patentee, after having taken out his Patent, must insert three times in the Government Gazette, his having taken his Patent, and describe his Invention, and also for the period he has taken it out.

IV.—Patents to last 25 years for the United Kingdom. But if required beyond that period, to pay as a Government Tax according to the following scale, viz.

For 25 years	£10
For 50 years	20
For 75 years	30
For any number above 75 years	50

No Patents will be renewed after the expiration of their respective periods.

V.—No Patent to be deemed good or legal, unless taken out from this Chartered Company.

VI.—All Infringements, or what are called Improvements, on other persons' Patents, if deemed an Infringement by the Patentee, to be decided by a full Board, consisting of all the Members of the Chartered Company, from which no appeal is to be afterwards made in any Court of Law.

This will operate every way with regard to the saving of Law expenses, equally to all the parties concerned.

VII.—All new substances made, all new invented machines, all principles newly discovered, all new applications which when reduced into practice to produce some article fit for sale; all chemical discoveries, methods or process which result in, or produce an article of commerce, shall be the subjects for which Patents shall be granted.

VIII.—The printed document given from this Company as a security to the Patentee, as a security for his Invention, shall be printed on parchment, with the Government Stamp for the amount of the sum paid, the name of the article or Invention, and the period the Patent is granted.

N.B.—Other rules could be added if necessary.

To the Editor of the London Journal and Repertory of Arts.

SIR,

HAVE the goodness not to lose sight of the clauses proposed below, which are, in the opinion of myself and many others, considered to be of very great importance, both to the public and all Patentees, so much so, that few clauses will be found more essential.

Clauses recommended to be inserted in the amended Bill for Patents.

1st. And whereas much mischief arises, both to the proprietors of Patents and to the public at large, by reason of persons pretending, by advertisement and otherwise, that certain article or articles vended by them are Patent Inventions; be it enacted, that any person or persons so offending, shall forfeit the sum of ten pounds for each offence.

2nd. And be it further enacted, that one moiety of the forfeiture hereby imposed shall, if sued for within three calendar months from the time of such forfeiture being incurred, be to his Majesty, his heirs and successors; and the other moiety, with full costs of suit, to the person or persons who shall inform or sue for the same within the time aforesaid, and which shall and may be sued for in His Majesty's Court of Exchequer at Westminster.

NEW PATENT LAWS.

The Bill before Parliament for amending the Laws relating to Patent Inventions, is still under the surveillance of the Select Committee of the House of Commons, but it is expected that it will be reported to the House in a day or two (probably before this meets the public eye). The several clauses have, as we understand, been materially altered, and we should be glad if we could add improved, but, from the draft copy that has been handed to us as the most improved edition of the amendments upon the proposed Bill, which we believe to be correct, though of course cannot vouch for them until the Bill itself is printed, we have little to offer in the way of congratulation to the numerous readers of our Journal, who are deeply interested in the property of Patent Inventions.

It is intended by the Committee to divide the several clauses into two Bills; the one of which is to be read immediately and passed into a law, the other to remain for discussion in the next session. This is to be proposed as a matter of expediency, in order that those clauses which are open to discussion may not be brought before the House at this late period of the session, occupied as Parliament at present is with business of a more important nature, in the estimation of the political world.

Such a measure of expediency we have no objection to, as the immediate enactment of a part of the Bill will, at all events, recognize the right of inventors to legal protection, and we may then at a future day expect from Parliament a further consideration of the subject, with the view of granting to inventors a more complete security, and relief from that pecuniary pressure to which needy genius is at present subjected, by the useless retinue of state parade attendant upon the grant of Letters Patent for Inventions.

The following are the clauses of the Bill in the most amended state that we have been able to procure them:

I. WHEREAS it is expedient that the Laws respecting Letters Patent for Inventions should be explained and amended, and should be made effectual for the security of the property of the inventors in their inventions; be it therefore enacted, by the King's Most Excellent Majesty, by and with the advice and consent of the Lords Spiritual and Temporal, and Commons, in this present Parliament assembled, and by the authority of the same; that if any person in England, Scotland, the town of Berwick-upon-Tweed, Ireland, or the colonies, shall communicate or sell any invention, of which he is bona fide the inventor, to any person whomsoever, such last mentioned person shall, with the consent of such inventor, be at liberty to obtain Letters Patent in his own name, for the same invention; provided the said Letters Patent shall contain a recital, stating by whom the said invention hath been communicated or sold to the person to whom the said Letters Patent are granted, and that the said Letters Patent shall be void if it shall thereafter appear that any fraud has been used, or that the recital is untrue.

II. And whereas doubts have arisen respecting the subjects for which Patents ought to be granted; be it further enacted, first, that every new engine, manufactured article, or article of sale, and material thing produced artificially. Secondly, every new process used in making or obtaining any new or previously known engine, manufactured article, and article of sale, and material thing produced artificially, even if such process being only new as applies to the particular engine, manufactured article, or article of sale or material thing produced artificially, in question, or any part thereof. Thirdly, every new application of any known engine, manufactured article, or article of sale, material thing produced artificially, or process, such engine, manufactured article, article of sale, or material thing produced artificially, or process requiring some new modification, combination, or arrangement, for the purpose of such application. And, fourthly, every improvement on any known engine, manufactured article, or article of sale, or material thing produced artificially, or on any known process, shall be the subjects for which Letters Patent shall be granted: provided always, that nothing in this Act contained shall extend to allow any person to use the whole or any part of any invention, for which Letters Patent have been granted, for the purpose of any improvement of which such person may be the inventor, without the consent in writing of the Patentee.

III. And whereas it hath frequently happened, to the great prejudice of inventors, that on the trials of issues relating to Letters Patent, evidence has, for the purpose of shewing a want of perfect novelty in the invention, been given of a use prior to the granting of Letters Patent, of the subject of the Patent, in an imperfect state or manner, or privately, or at a period long anterior to the date of the Letters Patent; be it further enacted, that the Letters Patent shall not become void, although the subject of the Patent shall have been used either privately, or in an imperfect manner; nor if the same subject shall not have been practically used in a public manner within ten years next preceding the date of the said Letters Patent: Provided nevertheless that the persons who shall have so privately used or practised such subject of a Patent, whether perfectly or imperfectly, shall be allowed to continue to use or practise it in the same degree of perfection, and to the same extent, but no further.

IV. And whereas it sometimes happens that omissions or errors are accidentally or unintentionally made in the Patent, and in the specification, whereby Patents are rendered void: be it enacted, that every such Patent, or the specification, inrolled in compliance with the conditions thereof, as is or shall be bad in law as to part thereof, whether from want of novelty, insufficiency of decription, or from any other cause, shall not on that account be deemed bad in law as to the remainder thereof.

V. Provided always, and be it further enacted, that if upon the trial of any issue in, or directed by, either of the superior Courts of Record at Westminster, in which the validity or sufficiency of a Patent or Specification shall come in question, it shall appear that the Patent or Specification has been made or left, or continued erroneous, defective, or insufficient in description, for the purpose of defrauding the public of the full benefit of the invention, then and in such case the said Patent shall be and be deemed to be null and void, to all intents and purposes whatsover: provided always nevertheless, that if the Jurors, by whom such issue as aforesaid shall be tried, shall find the title to such Patent, or such original or amended Specification, was defective or insufficient in description, only from too extensive a claim of invention, or from inadvertence only, and without fraud, that then and in such case it shall be lawful for the Lord High Chancellor or Keeper of the Great Seal, upon petition made to him, stating the several facts of the case, to direct such alteration in the title of the Patent, and in the said Specification, or either of them, as shall truly describe the invention.

VI. And be it further enacted, that all such further and amended Specifications as are by this Act directed, shall be written each on parchment, having a stamp impressed thereon, of equal value with the stamp which would at the time be requisite on an original Specification, and shall be inrolled in like manner as original Specifications are now inrolled.

VII. And be it further enacted, that the Court or Judge before whom any proceedings at law or in equity shall be taken upon any Letters Patent, shall have power, and are and is hereby authorized to amend the title or specification in all matters of form.

VIII. And whereas it has been the practice to make the title to a Patent so vague and general, that the public have been unable to know for what particular object the Patent was sought, whereby caveats have been unnecessarily multiplied, and other inconveniences have been occasioned; be it enacted, that the inventor shall in all cases give such a title to his Patent as shall contain such an outline or sketch of his invention as will convey a clear and distinct idea of its nature and object.

IX. And be it further enacted, that Letters Patent shall, for the preservation of the property in the invention to the inventor, begin and take effect, and the Letters Patent shall bear date, on the day of presenting the Petition for the Patent, at the Office of the Secretary of State for the Home Department.

X. And whereas the use of the property in Letters Patent is limited without any corresponding advantage to the public; be it enacted, that every person to whom Letters Patent for an invention shall have been granted, shall be at liberty to assign or transfer his interest in the same Letters Patent, and to grant Licences to make or use the invention for which the same shall have been granted, in any manner or to any number of persons he may think fit.

XI. And whereas great delay, inconvenience, and expense have arisen, in consequence of a Patentee being obliged to sue in a Court of Equity, pending a suit in a court of common law: be it enacted that the plaintiff in an action in a common law court, may, by motion in that court, or by application to a judge thereof, obtain an order to stay the defendant from making or using the invention, unless an account be kept of the sale and use thereof, to be verified on oath, and rendered periodically, and at such times as such court or Judge shall direct.

XII. And be it further enacted, that the defendant in any action on a Patent, may plead the general issue: provided nevertheless that in every such action, the defendant shall at the time of pleading deliver a notice of all the objections and defences upon which he intends to rely at the trial of the issue, save and except in cases of *scire facias*.

XIII. And be it further enacted, that the venue in any action on a Patent may, on motion to the Court or Judge in which such action is brought, be changed from the county of Middlesex to any other county, if the said Court or Judge shall think fit.

XIV. And be it further enacted, that either party may obtain an order of the court in which such action is brought, that the jurors who are to try the issue may examine the specification and accompanying drawings at least two days before the day of trial.

XV. And be it further enacted, that this Act shall come into force and take effect from the passing thereof, and that all the provisions therein contained shall apply to all Letters Patent then unexpired, as well as to all Letters Patent thereafter to be granted.

XVI. Provided always, and be it further enacted, that this Act shall not extend, or be construed to extend, to any Letters Patent to uphold which, or for the infringement of which any suit or suits at law or in equity has or have been tried and determined in favor of the defendant or defendants in such suit or suits, or in which the plaintiff or plaintiffs at law have been nonsuited, or suffered judgment as in case of a nonsuit, or in which an injunction hath been refused, or having been granted hath been dissolved in any Court of Equity before the passing of this Act, nor to any Letters Patent in respect of which any suit or suits at law or in equity is or are now depending: And whereas by an Act made and passed in the twenty-sixth year of the reign of his late Majesty King George the Third, intituled, "An Act for the encouragement of the arts of designing and printing linens, calicoes, and muslins, by vesting the properties thereof in the designers, printers, and proprietors thereof for a limited time," continued by an Act made and passed in the twenty-ninth year of the reign of his said late Majesty, and made perpetual by an Act made and passed in the thirty-fourth year of the reign of his said late Majesty, the property in the patterns or designs for such purposes is secured to the inventors thereof for a limited time: And whereas it is expedient that original patterns for other purposes shall be secured to the inventors for a limited time, and that the time limited by the said Acts be in all cases extended; be it enacted, that the inventor of every new pattern for any manufactured article, his executors, administrators, and assigns, shall have the exclusive right to use the same pattern for and during the period of twelve calendar months next after the same shall have been made public.

XVII. And be it further enacted, that all and singular the clauses, provisoes, and regulations in the said before-mentioned or recited Acts contained, shall extend and apply to all new patterns for all manufactured articles to which they shall be found to be applicable.

(*All the following Clauses, excepting the last, are proposed to be embodied in a separate Bill.*)

XVIII. And be it further enacted, that notwithstanding any law or custom to the contrary, his Majesty shall be and is hereby empowered to grant Letters Patent for inventions for the term of seven years, or of fourteen years, at an expense proportionate to the term, as is hereafter expressed and enacted, for the sole working or making of any manner of invention in England, Ireland, Scotland, and the town of Berwick-upon-Tweed, or the Colonies, to the inventor of such manufacture, or his assignee, which others at the time of making such Letters Patent shall not publicly use in England, Ireland, Scotland, the town of Berwick-upon-Tweed, or the Colonies, so as it be not mischievous to the state: provided the said inventor shall particularly describe and ascertain the nature of the said invention, and in what manner the same is to be performed, by an instrument in writing under his hand and seal, and cause the same to be inrolled in the High Court of Chancery within a limited time next after the date of the said Letters Patent.

XIX. And whereas it has hitherto been the practice to grant separate Patents for England, or for England and the Colonies, for Ireland, and for Scotland, and such practice hath been productive of injury and delay to inventors, and of great unnecessary trouble and expense; be it enacted, that all Letters Patent for inventions shall be taken out in England, and shall be sealed with the great seal, and shall extend to and have effect in England, Ireland, Scotland, the town of Berwick-upon-Tweed, and the Colonies, and that such Letters Patent shall be granted upon the condition, to be expressed in such Letters Patent, that the inventor shall, within six calendar months next after the sealing thereof, inrol a specification in England in the usual manner now practised in England, and shall also within the same period inrol or deposit in Ireland and in Scotland, in each country, in the usual places of inrolment or deposit of specifications, a copy of the Patent and Specification.

XX. And be it further enacted, that Letters Patent for inventions may be granted to persons who shall have received the communication of the invention from persons residing in places out of his majesty's dominions: provided always, that in any such case the Patent shall be granted for the term of seven years only.

XXI. And whereas there is often great difficulty in getting a full description of an invention by which it can be readily performed or made, either by a written account or drawings thereof; be it further enacted, that it shall be lawful for the Patentee, in addition to, but not in any degree in substitution of, his written description, to deposit a model or pattern of his invention, with his specification, and that the said model or pattern may be produced or given in evidence in any Court of Law or Equity, with the specification.

XXII. And whereas great abuses have sprung up from the manner in which persons enter *caveats* in the Court of Chancery, and at the offices of the Attorney and Solicitor-General, and many inventors have been injured by the secrets of their inventions prematurely transpiring; be it enacted, that each person or party entering a *caveat* shall, at the time of opposing the grant of a Patent, lodge in the office of the Attorney-General, an outline or description of his own invention, which he imagines or thinks is about to be made the subject of Letters Patent to be granted to another person.

XXIII. And be it further enacted, that the Attorney or Solicitor-General shall and may, on the examination by him of the claims of contending parties under a *caveat*, award such costs as he in his discretion shall think fit to be paid by either of such parties to the other of them, and grant a certificate thereof under his hand, which certificate may be made a rule of either of his majesty's Courts of Record at Westminster, and the party to whom the costs are awarded shall have the usual process of attachment in case of non-payment thereof.

XXIV. And be it further enacted, that the fees payable for Letters Patent granted for the term of seven years, shall be two-thirds of the fees which shall be paid upon Letters Patent granted for fourteen years.

XXV. And whereas the sign manual of his Majesty, which, according to the present mode of obtaining Patents is requisite, may, without detriment to the public service, be dispensed with as to the warrant and bill of Letters Patent; be it further enacted, that the Lord High Chancellor or Keeper of the great seal may fix the great seal to Letters Patent for Inventions, upon the authority of the report and bill of his Majesty's Attorney or Solicitor General.

XXVI. And be it further enacted, that in every action or suit in which the validity or sufficiency of Letters Patent for an Invention, or of the Specification, shall come in question, the costs to be paid for either party to the other shall include the costs of necessary scientific witnesses, and also the costs of making necessary experiments.

XXVII. And be it further enacted, that this Act shall extend to Scotland and Ireland.

HEADS OF A BILL

FOR AMENDING

THE LAW RELATING TO PATENTS FOR INVENTIONS.

Proposed by the Committee held at the Royal Hotel,
MANCHESTER.

JOHN POTTER, CHAIRMAN.

WHEREAS it is expedient to amend the Laws relating to Patents for Inventions:—

Be it therefore enacted by the KING'S most Excellent MAJESTY, by and with the advice and consent of the Lords Spiritual and Temporal, and Commons, in this present Parliament assembled, and by the authority of the same, THAT so much of an Act passed in the Twenty-first year of the Reign of King James the First, entituled, "*An Act concerning Monopolies and Dispensations with Penal Laws, and the Forfeitures thereof,*" as relates to Letters Patent and grants of privilege for the sole working or making of any manner of new Manufactures within the

Realm, be, and the same is hereby repealed; except so far as relates to any Letters Patent or grants of privilege, heretofore granted under the authority of the same Act.

THAT Patents of Invention shall be granted for a limited time in the manner hereinafter mentioned, to those who in the Kingdom of England shall have made an Invention or essential Improvement in any branch of Arts or Manufactures; and also to those residing in England, who shall first introduce or practise an Invention or Improvement made in Foreign countries: and every such Patent shall confer on the inventor, his executors, administrators, and assigns, exclusive rights to the sole making, working, exercising, and vending of such Invention or Improvement, during the time therein limited: Provided, that Patents of Invention shall not confer any rights inconsistent with any other existing patent rights.

THAT every invention shall be considered new which has not been practically used within   years next preceding the date of the Patent, or which has been used only privately, or partially, and without any beneficial result.

THAT the applicant for a Patent of Invention shall present a petition to His Majesty, stating the intended title of the invention, and that he is, to the best of his knowledge, the true inventor thereof; or, in cases of communication from abroad, that such invention has not been before published in England, and praying for the grant of a Patent for the Invention for the term of seven years, or fourteen years, at his option; the statements in which petition shall be verified by affidavit.

THAT such Petition and affidavit shall be accompanied by a specification, sealed up, describing or defining the object, principles, and general nature of the invention, and of the method, or intended method, of practising the same, so as to distinguish the same from other known inventions.

THAT every Patentee shall also particularly specify and describe his invention, and the method of carrying into effect and practising the same, so as fully to enable others, practically acquainted with the branch of arts or manufactures to which such Invention belongs, to carry into effect and practise the same; which specification and description may be combined with, and included in, the specification hereinbefore required of the objects, principles, and general nature of the invention, or may be made by way of enlargement and completion of such first specification in manner hereinafter provided.

THAT such petition, affidavit, and first or only specification, shall be lodged at the office of the Secretary of State for the Home Department, and be thence forthwith referred to the Attorney or Solicitor-General, who shall thereupon cause notice of the application to be given in the *London Gazette*, published next after such reference, stating shortly the object of the invention or improvement.

THAT any person may, within Days after the publication of such advertisement, enter a caveat at the office of the Attorney or Solicitor-General against the grant of the Patent applied for, notice of which caveat shall be forthwith given to the applicant or his agent, and notice of the day appointed by the Attorney or Solicitor-General for hearing both parties shall be given to the applicant and opponent, or their respective agents.

THAT the Attorney or Solicitor-General shall, at the time appointed, proceed to the consideration of the said petition, and of the objection (if any) which shall be offered against the same, and shall, within thirty days from the date of the reference to him, make his report whether the Patent applied for ought to be granted or not; and within the term of FOUR Calendar Months from the date of his report, the petitioner may make and enrol any enlarged or completed Specification of his invention, as hereinafter mentioned.

THAT the person entering such caveat as aforesaid shall not offer any objection to the grant of the Patent applied for, other than that the applicant is not entitled to such grant, on the ground that the objector has already a vested Patent right, or has discovered and used a similar invention, for which he was about to solicit a Patent.

THAT the Attorney or Solicitor-General shall appoint two competent persons practically skilled in the Arts and Sciences, to be called Commissioners of Patent Inventions, whose duty it shall be to examine, and state in each case whether the applicant is entitled to the grant of a Patent; and if not so entitled, the ground of objection to the application, of the nature of which the applicant shall be informed.

THAT if the Attorney or Solicitor-General shall report in favour of the application, the Secretary of State shall issue a certificate of the Grant of a Patent to the applicant, for the period to be mentioned in such certificate: Provided, that several and distinct Inventions shall not be included in one certificate of Grant.

THAT within such period of time as shall be appointed in the said certificate of Grant, the Patentee may, if he shall think it necessary, make and lodge in the office of the Secretary of State, an instrument under his hand, containing an enlarged and completed Specification of his said invention; but such enlarged or completed specification shall not depart from the principle or objects embraced or stated in the first specification hereinbefore required.

THAT such specification may, for the better explanation and illustration of the invention intended to be described, refer to drawings, patterns, and models of the subject of such invention, which drawings, patterns, and models shall be considered parts of the said specification, and be delivered and kept therewith; and in every action or cause at law affecting any Patent, either party may obtain an order of Court that the Jurors may examine the drawings, patterns, and models (if any) lodged with the specification of such Patent before the trial.

THAT if any person shall, from any cause, be bad in law, for part only of the matters specefied therein, the same shall not, therefore, be bad in law as to the remainder of such matters; but in case any court of competent jurisdiction shall determine that such Patent is bad in law in part, the Patentee shall, within one calendar month after such determination shall have been pronounced, make and deliver a supplementary specification of his invention, confining the same to such part of his said invention as shall not have been declared bad as aforesaid.

THAT any inventor, having obtained a Patent for seven or fourteen years, or his assigns, may, at any time before the expiration of such term, present a petition for an extension of such term for seven years further, which petition shall state the grounds of such application, and shall be verified by affidavit, and the same shall be referred to the Attorney or Solicitor-General, who shall, within thirty days from the time of the said petition being presented, consider the allegations contained in the said petition and affidavit, and shall report on the fitness of such extension, and if such report to the Secretary of State shall be in favour of the extension applied for, a supplementary certificate for the extended term of seven years shall be made out and delivered to the applicant in like manner as the original certificate.

THAT the fees payable upon and for the grant of every Patent for England, if for the term of seven years, shall be £30, if for the term of fourteen years shall be £60, and the same sums on any extension of the original term. Every Patent granted as aforesaid may be extended to Ireland and Scotland, or either of those kingdoms, on payment of the additional sum of £20 for each kingdom, and the Secretary of State's certificate of grant shall express the same accordingly: provided, that the inventor shall, within fourteen days after the time limited for the making and delivery of his enlarged and completed specification in England, make and deliver at the office in Ireland, or the office in Scotland, a duplicate of such his enlarged and completed specification (if any), or otherwise, of his first and only specification, and of the drawings, patterns, and models accompanying the same.

THAT one-half of all such before-mentioned fees shall be paid by way of deposit at the time of presenting the petition for the Patent, in respect of which the same fees shall be payable, and the remaining half on the delivery of the certificate of grant to the patentee.

THAT if the Attorney or Solicitor-General for England shall report against the fitness of granting any Patent which shall have been applied for, then one-half of the said original deposit shall be returned to the applicant, together with his petition, affidavit, and specification.

THAT every person who shall enter a caveat against the grant of any Patent as hereinbefore mentioned, shall, at the time of entering the same, pay the sum of £10 to cover the office fees and expenses consequent on such caveat; and on the hearings consequent on such caveat, the original applicant for the Patent shall not be required to pay any fee.

THAT this Act shall commence and take effect, as to the mode of obtaining Patents and specifying Inventions, on the   day of   and that all the other provisions herein contained shall apply to Patents then in force, as well as to Patents thereafter to be granted.

THAT this Act shall not extend to Ireland or Scotland, further than is hereby expressly provided.

Society for the Encouragement of Arts, Manufactures, and Commerce.

The Rewards adjudged by the Society during the present Session, to the respective Candidates, in the following order. Presented by His Royal Highness the Duke of Sussex, President.

In the Classes of Mechanics, Chemistry, and Agriculture.

To Mrs. Gilbert, of Eastbourn, Sussex, for bringing sea-side shingle into cultivation, the silver Ceres medal.

— Mr. George Whitelaw, Eglington-street, Glasgow, for his proposed method of raising water, and his method of supplying water to high pressure steam-boilers, the large silver medal.

— Mr. W. Franks, Cursitor-street, Chancery-lane, for his combination of wheel-work for rapid rotatory motion, the large silver medal.

— J. Robison, Esq. Sec. R. S. Edin., Athol-place, Edin., for his experiments on the best form for canal boats, the large silver medal.

— Mr. W. Ward, Maria-street, Kingsland-road, for his bedstead for the use of invalids, the silver Isis medal.

— Mr. E. Ward, Bedford, for his tourniquet, the silver Isis medal, and 5*l.*

— Mr. W. Hutchinson, Sheffield, for his hare-lip forceps, the large silver medal.

To Lord John Hay, Capt. R. N., for a telescope holder for the use of a person with only one hand, the large silver medal.
— Mr. Wicks, Stockwell, for a fire-escape, the silver Isis medal.
— Mr. Geo. Henekey, Grove-end-road, St. John's-wood, for an apparatus for drawing water from the surface, the silver Isis medal.
— Mr. J. Rofe, Jun. 11, Bernard-street, Russell-square, for his hydraulic blow-pipe, the large silver medal.
— Mr. W. Pybus, Smithson-street, Gray's Inn-road, for his improved drill stock, the silver Isis medal.
— Mr. G. Farrow, Silver-street, Golden-square, for his machine for silvering looking-glasses, the large silver medal and 5*l.*
— Mr. W. Rogers, 54, High-street, St. Giles's, for his machine for parting combs, the large silver medal.
— Mr. Geo. Edwards, Lowestoff-harbour works, for his rod for taking soundings, the large silver medal.
— Mr. Michael Staunton, Craven-street, Strand, for his cutting-press for stationers, the large silver medal.
— Mr. J. Wilson Neil, 21, Battle-bridge, for his communication on the preparation of varnishes, the gold Isis medal.
— Mr. J. Williams, School-house, Spitalfields, for his method of taking copies of inscriptions, &c. from engraved stones, the silver Isis medal.
— Mr. James Hopkins, 10, Caroline-street, Bedford-square, for his scales for obtaining geometrical foreshortened lines in architectural drawings, the silver Isis medal.
— Mr. W. Flight, King William-street, for an instrument for drawing spirals, the silver Isis medal.
— Mr. J. Hammond Jones, 59, Greek-street, Soho, for a fluid for the use of painters in miniature, the silver Isis medal.
— Miss Eliza Manning, 17, Newman-street, for a model of a bust from the life, the large silver medal.
— Miss S. Jane Benson, North Cray-place, Kent, for a drawing in pencil of a landscape from nature, the silver Isis medal.
— Mr. S. George Hayes, 17, Myddleton-street, Spa-fields, for an outline anatomical drawing from a cast, the large silver medal.
— Mr. H. E. Kendall, Jun., 17, Suffolk-street, Pall-mall East, for an original drawing of architectural foliage, the silver Isis medal.
— Mr. J. W. Hance, 11, Montpelier-square, Brompton, for an original design for the interior of a picture gallery, the large silver medal.
— Mr. W. Barnes, Mercer's-hall, Cheapside, for an original design for a triumphal bridge, the large silver medal.
— Mr. Ed. Ellis, 36, Fenchurch-street, for a copy in water-colours of the tinterior of St Peter's at Rome, the silver palette.

To Mr. J. Peake, 46, Clarendon-street, Somers-town, for a copy in Indian ink of a Corinthian capital, the large silver medal.

— Mr. R. W. Billings, 65, Clarence-garden, Regent's-park, for an original perspective drawing of the interior of Covent-garden theatre, the silver Isis medal.

— Mr. Ed. Turnerelli, 62, Newman-street, for a finished drawing from a bust, the large silver medal.

— Mr. F. T. Baynes, 41, Burton-street, Burton-crescent, for an original group of portraits in miniature, the silver Isis medal.

— Mr. C. Camille Langlois, jun. 31, Burton-crescent, for an original portrait in oil, the gold Isis medal.

— Mr. J. Lilley, 3, Warren-street, Fitzroy-square, for an original portrait in oil, the large silver medal.

— Mr. Samuel Manning, jun. 17, Newman-street, for an orignal model of a figure, the gold Isis medal.

—Mr. Fred. Calvert, 21, Lambeth-road, Southwark, for an original marine painting in oil, the large silver mdeal.

— Mr. Alexander Crabb, Hill-street, Peckham, for an original composition in oil of fruit, the gold Isis medal.

— Mr. Ed. Baillie, 7, Henry-street, Cumberland Haymarket, Regent's Park, for an original enamel painting of a head, the large silver medal.

The Thanks of the Society have been voted to

— Mr. J. Bedford, of Leeds, for his method of preventing the calcareous deposit from hard water from adhering to the inside of steam-boilers.

— Mr. J. Baynes, of Blackman-street, Southwark, for his method of supplying a dye-house with hot water.

— Mr. W. Ward, Maria-street, Kingsland-road, for a proposed method of communicating between a stranded ship and the shore.

— Mr. James Heard, Blackheath, for his description of a wooden road at Petersburg.

— Mr. J. Holland, Manor-place, Walworth, for his improved shade for the lamp of a microscope.

— Capt. T. M. Bagnold, R.N. High-row, Knightsbridge, for his communication respecting the algarroba of Chili, and samples of its pods.

— Mr. C. Smythies, 39, Essex-street, for his comparative experiments on cultivating potatoes and turnips.

— T. Smith, Esq. of Leith, for his paper on the dry-rot of timber.

— J. Reeves, Esq. Clapham, for his Notices from Chinese documents of the method of making paper in China.

List of Patents

Granted in Scotland, from 8th January to 13th March, 1833.

To William Gutteridge, of the Minories, in the borough of the Tower Hamlets, civil engineer, and George Stevens, of Norwood, in the county of Surrey, sugar refiner, for an invention of apparatus for the manufacture and refining of sugar and other extracts, and applicable also to other purposes.—6th Jan.

To Charles Watt, of Clapham, in the county of Surrey, for an invention of a new or improved method or process of preparing tallow and stuff from fatty materials, and refining the same for the manufacture of candles and other purposes.—22nd Jan.

To Thomas Parsons, the younger, of Furnival's Inn, in the county of Middlesex, gentleman, for an invention of certain improvements in locks for doors and other purposes.—7th Feb.

To Joshua Wordsworth, of Leeds, in the county of York, machine maker, for the invention of certain improvements in machinery for preparing, drawing, roving, and spinning flax, hemp, wool, and other fibrous materials.—16th Feb.

To Sir Charles Webb Dance, of Hertsbourne Manor Place, in the county of Hertford, Knight, Lieutenant Colonel, for an invention of certain improvements in steam boilers.—21st Feb.

To Joseph Saxton, of Sussex-street, in the county of Middlesex, mechanician, for an invention of improvements in propelling carriages, and in propelling vessels for inland navigation.—21st Feb.

To William Lloyd Warton, of Dryburn, in the county of Durham, Esq. for an invention of certain improvements in steam engines for raising or forcing water.—21st Feb.

To John Reynolds, of Oakwood, near Neath, in the county of Glamorgan, iron master, for an invention of certain improvements in steam or other engines.—21st Feb.

To Jonathan Dickson and James Ikin, both of Holland-street, Blackfriars-road, in the county of Surrey, engineers, for an invention of improvements in the process of making gas from coal or other substances.—March 11.

To Richard Badnall, the younger, formerly of Ashenhurst Hall, near Leek, in the county of Suffolk, now residing in the town of Douglas, in the Isle of Man, gentleman, for an invention of certain improvements in the construction or formation of the trams or rails, or lines of rails or tram roads, upon which locomotive engines shall or may be worked, or may be employed.—11th March.

To John M'Curdy, of Southampton-row, in the county of Middlesex, Esq., in consequence partly of a communication by a certain foreigner residing abroad, for an invention of certain improvements in machinery for acquiring power in rivers and currents.—11th March.

To Richard Trevethick, of Lambourne, in the county of Cornwall, engineer, for an invention of an improvement or improvements on the steam engine, and the application of steam power to navigation and locomotion.—11th March.

To William Thomas Shallcross, of Holt Town, within the parish of Manchester, in the county palatine of Lancaster, mechanic, for an invention of certain improvements in looms or machines for weaving cotton, linen, silk, woollen, and other fibrous cloths and substances.—13th March.

New Patents

SEALED IN ENGLAND.

1833.

To Jonathan Hayne, of the parish of Saint James, Clerkenwell, in the county of Middlesex, silversmith, for certain improvements in the mode or method of making or manufacturing metal spoons, and other articles.—Sealed May 25th—6 months for inrolment of Specification.

To Robert Beart, of Godmanchester, in the county of Huntingdon, miller, for certain improvements in making or producing tiles for draining land, buildings, and other purposes.—Sealed May 25th—6 months for inrolment.

To James Jones, of Salford, within the parish of Manchester, in the county palatine of Lancaster, machine maker, for certain improvements in the making of rovings, spinning, and doubling of cotton, silk, flax, and other fibrous substances.—Sealed May 25th—6 months for inrolment.

To Francis Molineux, of New Bridge-street, Blackfriars, gentleman, for certain improvements in machinery or apparatus for making paper.—Sealed May 25th—6 months for inrolment.

To George Harris, of East Dulwich, in the county of Surrey, Esquire, for a method of reducing and preparing various vegetable substances (not hitherto in use for the like purpose), and for the manufacturing them into articles in general use, heretofore usually made from hemp and flax.—Sealed June 1st—6 months for inrolment.

To John Burton, of Goswell Road, in the county of Middlesex, engineer, for improvements in the construction and application of pumps and machinery, for raising fluids and other purposes.—Sealed June 1st—6 months for inrolment.

To George Carter, of Nottingham Lodge, in the county of Kent, gentleman, for certain improvements in paddle wheels.—Sealed June 1st—6 months for inrolment.

To Pierre Antoine Angilbert, of Upper Charles-street, Northampton-square, in the county of Middlesex, gentleman, for his invention of certain improvements in preserving animal and vegetable substances.—Sealed June 1st—6 months for inrolment.

To Charles Madeley, of Gibson Hall, in the parish of Coleshill, in the county of Warwick, farmer, for his invention of a scarifier or harrow.—Sealed June 1st—2 months for inrolment.

To William Jessop, of Butterley Hall, in the county of Derby, Esquire, for improvements in constructing railways, —Sealed June 1st—6 months for inrolment.

To Charles Jones, of Birmingham, gun maker, for a new arrangement of additions to, and alterations in, certain parts of gun and pistol locks.—Sealed June 12th—6 months for inrolment.

To James Caldwell, of the New Crane, Shadwell, in the county of Middlesex, coal merchant, for certain improvements in cranes, vessels, and apparatus for delivering coals from shipping to wharfs, warehouses, waggons, or carts, without the employment of lighters as usual, and the whole or parts of which said improvements are also applicable to other purposes.—Sealed June 12th—6 months for inrolment.

To Thomas Wrigley, of Bridge Hall Mills, near Bury, in the county of Lancaster, paper maker, for an improved pulp strainer, to be used in making paper.—Sealed June 20th—6 months for inrolment.

To Joseph Gibbs, of East Smithfield, in the county of Middlesex, engineer, and Augustus Applegath, of Crayford, in the county of Kent, calico printer, for their invention of certain improvements in the construction of rail roads, bridges, piers, jetties, and aqueducts, parts of which may be applied to other useful purposes.—Sealed June 20th—6 months for inrolment.

To Andrew Ure, of Charlotte-street, in the parish of Saint George, Bloomsbury, in the county of Middlesex, doctor of medicine, for an improved apparatus for evaporating syrups and saccharine juices, which is also applicable to other purposes.—Sealed June 20th—6 months for inrolment.

To William Newton, of the Office for Patent Inventions, Chancery Lane, in the parish of Saint Andrew, Holborn, in the county of Middlesex, civil engineer, for an improved apparatus for boiling, evaporating, and concentrating syrups for the production of sugar, and also of saline liquors, or for the crystallization of salt; which apparatus may also be employed in the process of distillation, being a communication made to him by a foreigner. —Sealed June 20th—6 months for inrolment.

CELESTIAL PHENOMENA, FOR JULY, 1833.

D.	H.	M.	
1	0	0	Clock after the Sun 3 m. 24 s.
	—		Sun rises 3 h. 49 m. sets 8 h. 18.
	—		Moon rises 8 h. 3 m. p. m. sets 3 h. 13 m. A. M.
	—		Moon passes the meridian 12h. 49 m.
	—		Moon eclipsed visible see note
0	12	13	Ecliptic opposition or ○ full moon.
0	18	0	☉ in Apogee.
0	22	0	♀ in Aphelio.
4	14	38	Jupiter's third sat. will emerge
5	0	0	Clock before the ☉ 4 m. 8 s.
	—		☉ rises 3h. 52m. sets 8 h. 16 m.
	—		☽ rises 10 h. 33 m. P. M. sets 7 h. 0 m. A. M.
	—		☽ passes mer. 15 h. 11 m.
0	28	0	☽ in Apogee.
6	0	0	Mer. R. A. 8 h. 25 m. dec. 21. 0. N.
	—		Ven. R. A. 3 h. 56 m. dec. 16. 25. N.
	—		Mars R. A. 9 h. 41 m. dec. 15. 8. N.
	—		Jup. R. A. 2 h. 0 m. dec. 10. 5. N.
	—		Sat. R. A. 11 h. 37 m. dec. 4. 53. N.
	—		Georg. R. A. 21 h. 38 m. dec. 14. 54. S.
	—		Vesta R. A. 19 h 2. m. dec. 22. 53. S.
			Juno R. A. 14 h. 42 m. dec. 1. 0. S.
	—		Pallas R. A. 4 h. 56 m. dec. 1. 30. S.
	—		Ceres R. A. 6 h. 24 m. dec. 24. 53. N.
10	0	0	Clock before the Sun 4 m. 55 s.
	—		☉ rises 3 h. 56 m. sets 8 h. 13 m.
	—		☽ passes the mer. 18 h. 44 m.
10	4	7	☽ in □ or last quarter.
10	20	44	☽ in conj. with ♃ long. 28. in Aires. ☽ lat. 5. 8. S. ♃ lat. 1. 14. S. diff. of lat. 3. 54.
13	10	28	☽ in conj. with ♀ long. 7. Taurus. ☽ lat. 3. 15. S. ♀ lat. 3. 52. N. diff. of lat. 37.
15	0	0	Clock before the sun 5 m. 33 s.
	—		☉ rises 4 h. 2 m. sets 8 h. 9 m.
			☽ rises 2 h. 4 m. A. M. sets 6 h. 36 m. P. M.
15	0	0	☽ passes the meridian 23 h. 11 m.
17	0	0	☉ Eclipsed visible, see note.
17	7	10	Ecliptic conj. or ● new moon.
18	3	0	☽ in Perige.
18	14	12	Jupiter's first sat. will im.
18	15	24	☽ in conj. with ☿ long. 23. in Can. ☽ lat. 3. 8. N. ☿ lat. 13. diff. of lat. 2. 55.
19	3	40	☽ in conj. with ♂ long. 5. Leo. ☽ lat. 3. 41. N. ♂ lat. 1. 5. N. diff. of lat. 2. 36.
			Half Axes } 38. 20.
			Jupiter's ring } 0. 82.
20	0	0	Clock before the sun 5 m. 58s.
	—		☉ rises 4 h. 8 m. sets 8 h. 3 m.
	—		☽ rises 8 h. 1 m. A. M. sets 10 h. 14 m. P. M.
	—		☽ passes the mer. 3 h. 10 m.
			Mer. R. A. 9 h. 45 m. dec. 13. 28. N.
	—		Venus R. A. 4 h. 44 m. dec. 18. 34. N.
	—		Mars R. A. 10 h. 14 m. dec. 12. 5. N.
	—		Jupiter R. A. 2 h. 7 m. dec. 11. 31. N.
	—		Saturn R. A. 11 h. 41 m. dec. 4. 25. N.
	—		Georg. R. A. 21 h. 37 m. dec. 15. 3. S.
	—		Vesta R. A. 18 h. 48 m. dec. 4. 11. S.
	—		Juno R. A. 14 h. 43 m. dec. 1. 51. S.
	—		Pallas R. A. 5 h. 24 m. dec. 2. 8. S.
	—		Ceres R. A. 6 h. 51 m. dec. 24. 57. N.
20	13	16	Jupeter's second sat. will im.
23	9	34	☽ in □ or first quarter.
25	0	0	Clock before the sun 6 m. 9 s.
	—		☉ rises 4h. 15 m. sets 7h. 57 m.
	—		☽ rises 3 h. 35 m. P. M. sets midnight.
	—		☽ passes the meridian 7h. 20m.
26	0	0	☿ Elong. max. E. 27. 9.
	—		♀ Elong. max. W. 45. 45.
27	0	0	○ and ♄ in quadrature
27	13	27	Jupiter's second sat. will im.
29	12	0	☿ in aphelio.
31	3	1	Ecliptic oppos. or ○ full moon.

J. LEWTHWAITE, Rotherhithe.

THE HURRICANE.

Hurricane.—On the 11th we were visited by a more violent storm of wind than has perhaps ever before occurred in this part of the country in the summer season, certainly never remembered in the month of June. At sun rise the atmosphere was calm and cloudless, and so continued till near seven, when the clouds rose, and the wind blew in gusts, which carried away leaves and fruit of all trees exposed to its force; the storm, however, was not at its height till noon, from which time, till near five, it blew with such terrific force, that many lofty elms and oaks were torn up by the roots, and thrown upon the ground. In several gardens; the trees have lost more than half their fruit. The appearance of the leaves is that of having been parched by heat, arising, however, merely from the violent concussion. Haymaking, which had been in most cases deferred till the 10th, in hopes of rain, was a complete scene of confusion; any attempt to keep it together in the open field was fruitless, and in some cases the meadow parted with its grass, to cover a field of potatoes; while in other cases, where adjoining fields have been the property of more than one, it has led to strange controversies as to how much the neighbour's field may have been benefitted by the gust of wind.

Edmonton. C. H. ADAMS.

ECLIPSES.

July 1st —An eclipse of the moon, visible at Greenwich.

	H.	M.
Beginning	11	1½
Ecliptic opposition	12	33
Middle	12	39¼
End	14	17¼

Digits eclipsed 10. 18. from the northern side of the ⊖'s shadow, or on the southern limb of the ☽

July 16th —A large eclipse of the sun, visible at Greenwich.

Beginning	16	58
Greatest obscuration	17	49¼
Middle	17	50½
Visible conjunction	17	52¼
End......	18	43¼

Digits eclipsed 8. 50. on the ⊙ northorn limb.

J. LEWTHWAITE.

METEOROLOGICAL JOURNAL,

FOR MAY AND JUNE 1833.

1833.	Thermo.		Barometer.		Rain in inches.
	Hig.	Low	Hig.	Low.	
May.					
26	65	41	30,11	30,03	
27	67	40	30,23	30,18	
28	71	40	30,15	30,11	
29	67	39	30,11	Staty.	
30	69	40	30,24	30,18	
31	70	37	30,28	Staty.	
June. 1	77	40	30,18	30,05	
2	75	46	29,96	29,57	
3	67	46	29,53	29,51	
4	63	40	29,59	29,56	
5	70	39	29,70	29,64	
6	71	41	29,86	29,76	
7	70	39	29,99	29,92	
8	73	41	30,13	30,04	
9	75	40	30,24	30,19	
10	78	40	30,24	30,19	
May.					
11	64	41	29,72	29,64	
12	64	41	29,74	29,69	
13	57	40	29,61	29,53	
14	61	39	29,50	Staty.	,275
15	67	39	29,58	29,52	
16	70	36	29,68	29,64	,1
17	67	37	29,83	29,76	,125
18	70	46	30,04	30,01	,05
19	68	46	29,95	29,90	
20	68	45	29,86	Staty.	
21	71	39	29,92	29,87	
22	68	41	29,92	29,81	
23	62	39	29,58	29 47	,225
24	61	43	29,69	29.54	,25
25	64	40	29,85	29,76	,025

Edmonton.

CHARLES HENRY ADAMS.

Latitude 51° 37 32 N.
Longitude 3 51 West of Greenwich.

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